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# Aminophyllin, Its Uses and Its Effect on the Electrocardiogram*

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Aminophyllin, a combination of ethylene diamine with theophylline was intr duced to the medical profession by Dessauer[1] in 1908 under the name of Euphylli . It has since then been known as metaphyllin, theophylldine and more recently as aminophyllin. This drug is one of several combinations of theophylline. These combinations are loose chemical mixtures that break down in the stomach to release free purine and the substance that has been used to increase solubility. The ethylene diamine fraction of aminophyllin increases its solubility in water to forty percent. The theophylline content varies between 78 and 83 percent. The solubility of the drug determines its availability for use by routes of administration other than the oral route.

For years previous to the introduction of aminophyllin various combinations of theobromine and theophylline had been used in the treatment of arterial diseases. Their low solubility however, limited their field of usefulness. Aminophyllin being more soluble than any of the other combinations of theophylline was immediately used in treatment by the intramuscular and intravenous routes of administration.

The therapeutic effectiveness of aminophyllin, as with other combinations of theophylline, depends to a large extent upon the amount of theophylline present, while the mode of administration of the drug and its rapidity of action depends upon the solubility. Upon the theophylline contents of the drug will also depend the gastric symptoms arising from excessive doses or when used in individuals sensitive to the theophylline preparations.

The untoward symptoms occurring in those intolerant to aminophyllin are referable to (1) The gastro-intestinal system, with such symptoms as gastric distention, nausea and vomiting and a burning epigastric or substernal pain; (2) The head, with headache, throbbing in character or a general fullness; vertigo or lightheadedness; (3) The nervous system, with subjective nervousness, a heightened degree of sensibility and at times a tremor; (4) The heart, with cardiac palpitation and precordial pain or oppression.

The routes of administration followed in the use of aminophyllin are, (1) oral—the drug being given in capsules or tablets in a dose that is variable and dependent upon the severity of the symptoms present. The average dose is 9 to 15 grains a day. (2) Rectal—as suppositories or in a solution of glucose; the average dose by this method is 7½ grains. (3) Intramuscular injection—in a dose of 3¾ grains (0.25 gm.) to 7½ grains (0.48 gm.) (4) Intravenous injections—the drug being given in distilled water, saline and hypertonic glucose solutions, in a dose of 3¾ grains (0.24 gm.) to 7½ injection.

Aminophyllin may be used as a diuretic in cardiac, renal and hepatic insufficiencies. It is of particular value when used in the oedema of congestive heart failure. When taken by mouth it is less effective in producing diuresis than theophylline or other combinations of theophylline. However,

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when used intravenously it is of equal value and in some cases it is more effective than theophylline. The diuretic effect is produced by direct cellular action on the kidneys, by vasodilatation of the renal vessels with consequent increase in the blood supply, by the stimulation of the flow of water and chlorides in the tissues to the blood stream, and by a very slight depression of tubular reabsorption.

The diuretic effect of aminophyllin is increased when it is given simultaneously with a mercurial diuretic such as salyrgan. Several combinations of a xanthine with a mercurial have been in clinical use for some years. The most effective and least toxic preparations are those of mercurpurin and salyrgantheophylline. It is our opinion however, and this seems to be confirmed by such investigators as Hermann,[2] that when a salyrgan and aminophyllin are given simultaneously, they are more effective than either of the above two xanthine mercurial preparations.

The simultaneous use of aminophyllin and salyrgan permits the reduction in the dose of salyrgan. It has been found that when salyrgan is given with aminophyllin it is less irritating and toxic. This is probably due to the increased rate of absorption of the mercurial from the site of injection. In one hour, ninety-seven percent of the drug has disappeared from the muscle site. The combination is more effective in removing oedema because of its double effect, renal cellular stimulation and tubular depression.

Aminophyllin when combined with hypertonic glucose solution in congestive heart failure produces a marked increase in diuresis. This increase is more pronounced than with either alone. Its simultaneous use with digitalis in the above clinical condition produces a more rapid reduction of the oedema, with increased diuresis occurring as a result of the direct renal stimulation plus the secondary effect on the myocardium.

Other conditions benefited by the use of aminophyllin are as follows: eclampsia, postoperative anuria and the oleigurias of grippe, pneumonia, diphtheria, scarlet fever, tetanus, mercurial intoxication and the coma of barbiturates.

This drug may also serve effectively as a respiratory stimulant in the abnormalities of respiration associated with congestive heart failure. These abnormalities are (1) simple dyspnoea, (2) paroxysmal nocturnal dyspnoea or cardiac asthma (3) Cheyne-Stokes respiration.

The simple dyspnoea associated with hypertensive and arteriosclerotic heart disease is manifested in the early stages by the inability of the patient to exercise moderately without discomfort and in the later stages by orthopnea. It may be distinctly benefited by the oral use of aminophyllin when used early in the disease and continued for long periods of time. The drug is less effective in heart disease of other types.

In paroxysmal nocturnal dyspnoea or cardiac asthma which is a manifestation of acute left ventricular failure, distressing episodes of breathlessness are benefited or completely relieved by the intravenous use of aminophyllin at bedtime, in doses of 0.24 gm. to 0.48 gm. The latter dose is used in the more severe cases. It may be continued twice daily, in the same dose, in those cases not responding to a single injection at bedtime.

The third type of respiratory abnormality occurring in congestive heart failures is Cheyne-Stokes respiration or the periodic breathing or heart disease. It is usually associated with cardiac failure of hypertensive and arteriosclerotic origin. It may, however, occur in uremia and with drug poisoning. Its appearance is likewise an indication of a left ventricular failure. The attacks may be continuous day or night, or they may be paroxysmal with short or long intervals of freedom. They occur more frequently at night, the patient usually awakening during the apnoeic interval. This is more apt to be the case when the apnoeic interval is markedly prolonged. The hypernoeic interval following the awaking is expressed symptomatically by marked efforts at breathing and is accompanied most commonly by a pronounced sleep-disturbing fear.

Vogl[3] in 1927 was the first to call attention to the intravenous use of aminophyllin in this abnormality of respiration. In 1932, reporting on five years of consecutive use of the drug, he stated that he had never failed to restore the respiration to normal.

The inadequate symptom complex often presented to the physician by the patient who suffers from Cheyne-Stokes respiration or from paroxysmal nocturnal dyspnoea increases the diagnostic difficulty. As a consequence, the case may remain undiagnosed for some time. This is particularly true when normal respiration is restored shortly after the patient awakens. When doubt exists as to the nature of the respiratory complaint, aminophyllin may be used as a test in a suppository or in a glucose solution administered by rectum at bedtime. The dose for this purpose is 0.48 gm. If this dose is effective in relieving or controlling the nocturnal attacks the drug may then be continued in this manner or it may be given intravenously. If a single intravenous dose given at bedtime fails to control the attack, an additional similar dose may be given during the day until the attacks have ceased. With cessation of

the attacks the drug should be administered by mouth over a long period of time.

In order to avoid unpleasant reactions such as headache, faintness and dizziness, syncope, or a marked increase in respiratory rate, such as may occur if the drug is given during a period of hyperpnoea, it is well to administer the dose slowly, over a period of three to five minutes in twenty cc. of saline or glucose.

Another mode of intravenous administration[4] that has proved to be effective consists in dissolving the total dose of 0.48 gm. of aminophyllin in 2 cc. of distilled water. This total dose is given in four divided doses of 0.5 cc. each, administered at the decrease of the respiratory movement. In this manner it is possible to avoid respiratory stimulation which may occur when the drug is given during the hyperpnoeic interval. The drug may also be given by mouth during the attack in a 0.5 gm. tablet.

It is impossible, due to the present limit of time, to discuss in any detail the mechanism of the respiratory abnormalities in congestive heart failure. The theories suggested are briefly as follows: (1) The orthopnea is due to changes in vital capacity and lung volume;[5] (2) the orthopnea is due to an increased cerebral venous pressure with the slowing of the intracranial blood flow and an anoxemia of the respiratory center;[6] (3) orthopnea and other respiratory abnormalities of congestive heart failure are due to an increased cerebral spinal fluid pressure and venous pressures.[7-8-9] The following facts are used as evidence for this last theory—(1) both pressures fall with the return of compensation; (2) there is a reduction of pressure in the sitting posture; (3) the relief of symptoms may be secured by spinal drainage.

The effectiveness of aminophyllin when used in respiratory abnormalities is based upon its ability to produce a prompt reduction of both intrathecal and venous pressures. Coinciding with this reduction, dyspnoea is relieved and Cheyne-Stokes respiration is returned to a normal rhythm. The reduction of the cerebral spinal fluid and venous pressures with improvement in the cerebral circulation is the result of improved myocardial tone. It may be well to note here that some observers[4] claim that the improvement in respiration is due to the direct stimulating effect on the respiratory center of the ethylene diamine fraction of the drug. The same observers have noted, however, that the compound may be more effective in cases in which the ethylene diamine fraction failed to act.

Aminophyllin may be of benefit in respiratory abnormalities other than those associated with congestive heart failure. The following conditions may be benefited by its use: (1) the dyspnoea of the obese; (2) the dyspnoea of pulmonary tuberculosis; (3) narcotic accidents with respiratory cardiac collapse; (4) toxic coma; (5) general intoxication; (6) central respiratory difficulty as in the pneumonia of infants; (7) chronic bronchial asthma.

In chronic bronchial asthma, Hermann[10] has shown that status asthmaticus, with reduced adrenalin sensitivity, may be definitely relieved by the intravenous use of this drug. He has reported in his study that some cases show a return of adrenalin sensitivity following its use.

Aminophyllin has been used as a vasodilator in the treatment of coronary artery disease, coronary thrombosis and the anginal syndrome. The literature on this use of the drug in these conditions indicates a difference of opinion among authors as to the value of this drug in relieving the symptoms for which it is used in treatment. The clinical value of aminophyllin should be based upon its effectiveness in dilating the coronary vessels and thus secondarily improving myocardial tone and function.

It has been conclusively demonstrated by perfusion experiments in animals[11-12] that the perfusion rate is increased following the addition of theophylline ethylene diamine to the perfusion fluid. In some cases the rate of flow is increased by the drug to 80 percent. These experiments may serve as a basis for the clinical use of this drug in coronary artery disease.

Clinical reports following its use in the anginal syndrome confirm these experimental conclusions.[13-14-15-16-17-18] These reports on the effectiveness of the drug in the anginal syndrome were based upon the reduction of the intensity or the complete control of the pain in the exercise tolerance test. Several observers [19-20-21] contrary to the above favorable results have reported completely negative results following the use of aminophyllin in the anginal syndrome.

The usefulness of the drug in coronary thrombosis, with infarct of the myocardium, depends upon its ability to produce dilation of the collateral circulation of the infarct with a consequent increase in the rate of healing of the infarct. The evidence for this effect on the collateral circulation following infarct was presented by Fowler[22] in 1925. He showed that the intravenous use of aminophyllin, following the artificial occlusion of the coronary arteries of dogs, resulted in an improvement of the color of the infarct within two minutes, an increased rate of healing and reduction in size of the healed infarct. Other observers [23-24] using different

bases for the effectiveness of the drug or using the drug by some other route than intravenously have failed to confirm Fowler's results.

We believe that the experimental and clinical evidence offers a reasonable basis for the use of aminophyllin in diseases of the coronary arteries, with or without anginal pain, and in coronary thrombosis. In the anginal syndrome, the drug may be used orally in doses of 9 to 15 grains daily. The intravenous administration may be employed when attacks are severe, persistent, or frequently recurring. It is well to alternate the drug with other combinations of theophylline when tolerance begins to appear. Alternation of these compounds may likewise prevent the development of disturbing gastric symptoms.

In coronary thrombosis, aminophyllin is used intravenously at the time of the attack, in a dose of 0.48 gm. It may then be given intravenously twice a day until the acute symptoms have ceased. This may necessitate its use in this manner for 8 to 10 days and following this, one intravenous dose may be given at bedtime for a brief interval, or until respiratory abnormalities have disappeared. During these latter intervals the concurrent use of the drug by oral administration is recommended.

We have noted in some cases of coronary thrombosis a complete relief of the pain after intravenous aminophyllin. The dose of the narcotic used to relieve the pain of the acute attack may be reduced and, in some cases, completely discontinued when aminophyllin is used. Many patients have stated that the weakness and extreme fatigue accompanying the attack is less pronounced and that a feeling of well-being is produced. We do not advocate, however, that this drug should be used to the exclusion of other valuable therapeutic procedures in the treatment of these severe cardiac accidents. The drug is at best only an adjuvant in a complex therapeutic regime. It should be used cautiously and should be discontinued with the occurrence of untoward symptoms or severe reactions. We have never observed any fatality following the administration of this drug.

The effect of Aminophyllin on the Electrocardiogram: The difference of opinion existing in the literature regarding the effective dilating action of aminophyllin on the coronary arteries led us to a study of the effect of this drug on the electrocardiograms of cases of known heart disease or evident arteriosclerosis. It was our hope that evidence might be adduced from changes in the electrocardiogram that would prove to be of some value in solving this unsettled question.

The literature is notably lacking in experimental work on the human subject. In the electrocardiographic studies on animals subjected to artificial coronary occlusion little change was noted in the electrocardiogram following the intravenous administration of aminophyllin subsequent to the induced occlusion. The literature shows a striking lack of studies on the effect of the drug on the electrocardiogram of human subjects. One clinical investigator Falk using the drug intravenously in coronary thrombosis has reported a definite change in the electrocardiogram. The altered waves tend to return to a more normal appearance.

This study was conducted at the St. Louis County Hospital, the material for study being selected from the general wards of this hospital. The procedure followed consisted of taking three standard Leads and One Chest Lead before the test was started. Aminophyllin was then given intravenously in a dose of 0.48 gm. The introduction was slow in order to avoid a reaction but in spite of this, several patients complained of dyspnoea, flushing of the face, fullness in the head, anxiety, nervousness, faintness or palpitation. Loss of consciousness with vomiting occurred in two cases. These cases were both women, classified as "neurotic." Emotional instability undoubtedly contributes to the severity of the reaction following the introduction of the drug. Subsequent electrocardiograms were taken during the injection and at fairly constant intervals of three, five, ten and twenty minutes and in some cases thirty minutes. A few of these electrocardiograms showing the most pronounced changes are presented together with some of the salient facts of the patients' histories and physical findings.

## DISCUSSION

It can be easily seen from the electrocardiograms presented, that changes occur in the electrocardiograms of cases of known heart disease of arteriosclerotic and hypertensive origins when aminophyllin is injected intravenously. It seems hopeless at this time to attempt to correlate these changes or to classify them in relation to specific factors.

The increase in heart rate seen fairly constantly in these tracings is most probably due to the fall in blood pressure with the consequent compensatory tachycardia. The emotional state and the subjective response of the patient to the drug plays no small part in the occurrence of a rapid heart rate. The tachycardia had little, if any, direct relation to alterations of the pace-maker or the intrinsic conduction mechanism of the heart.

The electrocardiogram is but a pictorial record of the electrical changes in the heart muscle during systole and diastole and represent the fluctuation in electrical potential

during each cardiac cycle. From the contracting healthy myocardium, a certain complex configuration is recorded with the electrocardiograph. If anything happens to disturb the electrical conductivity or electrical continuity of that heart muscle there result changes in the tracing obtained.

It is assumed, therefore, that the changes recorded above are the results of variations in the myocardial conductivity. These changes are transient and occur very rapidly after the drug is administered. Since aminophyllin causes vascular dilation elsewhere in the body and since the stated character of the electrocardiographic response may be assumed to be due to alterations in blood flow, it may be further assumed that changes in the coronary circulation are responsible for alterations of the electrocardiograms subsequent to the injection of aminophyllin.

If such reasoning is sound, then it might further be assumed that those cardiac cases in which the electrocardiograms remained unchanged following the administration of the drug were cases with myocardial damages too advanced to be altered; with coronary arteries too sclerotic to be dilated; or with a collateral circulation inadequate to effect the nutritional state of the muscle.

It is hoped that further investigation will be stimulated by such assumptions, since many possibilities are suggested. A larger series of such cases with a positive response to the drug may indicate some prognostic value in the use of aminophyllin. Changes in the above tracings may then be sufficient evidence for a coronary circulation capable of alternations and therefore amenable to therapy.

## SUMMARY AND CONCLUSIONS

1. Aminophyllin is of value in producing diuresis in congestive heart failure and when administered concurrently with salyrgan enhances the effect of the latter drug.

2. Respiratory abnormalities due to congestive heart failure are relieved or returned to a normal status by aminophyllin administered by oral or intravenous routes. The latter method is more effective in the acute attacks.

3. Perfusion experiments demonstrate that coronary artery blood flow is increased by aminophyllin. The results of clinical and experimental studies are at variance as to the value of this drug in coronary occlusion and the relief of the pain of the anginal syndrome. The consensus of clinical experience favors its use in these conditions.

4. Electrocardiograms were studies in thirty-eight cases to determine changes induced by aminophyllin when administered intravenously in doses of 0.48 gm. Thirty-five of these cases had a true heart disease with or without an anginal syndrome. Three cases had no obvious cardiac disease.

5. Twenty-six electrocardiograms showed changes following the injection of aminophyllin. In twelve cases there was no apparent change.

6. There was no regularity in the alternations of the tracings that could be related to the clinical diagnosis, the degree of myocardial damage, the age, the blood pressure or to other factors.

7. The changes occurring in the electrocardiograms were concerned chiefly with the T waves of one or all Leads. An adequate explanation of these changes cannot be as yet offered.

8. A plausible explanation of the changes is based upon the possible increase in the blood flow to the myocardium through the dilation of coronary vessels with the consequent alteration of the electrical conductivity of the heart muscles.

9. Studies on this subject should be continued to determine if possible the prognostic significance of these alterations in the electrocardiogram.

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# "Assmann's Foci"—Infraclavicular Infiltration
## A Form of Early Pulmonary Tuberculosis In Adults*

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The prevailing conception of the origin of pulmonary tuberculosis has been greatly revised, since Assmann published his first observations in 1921 on infraclavicular infiltrations, which he believed to represent the early stages of pulmonary tuberculosis in young adults.

According to Assman's original description, the lesion consists of an isolated, round focus of varying density, usually situated just below the clavicle, in the lateral part of the lung field, more rarely in the lower portion of the upper lobe. This focus is usually sharply circumscribed, and definitely contrasted, but it may be of only slightly increased density, and merge gradually with the normal surrounding pulmonary parenchyma. Assmann stressed, as particularly significant, the fact, that in contradiction to the generally accepted idea, that tuberculosis of the lungs nearly always begins in the apices, the infraclavicular focus is associated with absolutely normal apices.

Fluroscopy must be considered an integral part of the roentgen-examination, if this lesion is to be detected in all cases, in which it is present.

An infraclavicular infiltration—"Assmann focus"—may easily be hidden by the shadows of the scapula and the thoracic muscles. It is therefore necessary to examine the patient in all aspects, including the oblique views and dorsoventral and ventrodorsal positions.

In lateral views the Assmann focus is usually situated in the median posterior portion of the upper lobe. It lies, as a rule, in the neighborhood of the lateral and dorsal bronchial ramifications of the posterior bronchus of the upper lobe.

The central location of the focus, is responsible for very few or no physical signs. Only occasionally is it possible to elicit a change in the respiratory sound or fine rales in the interscapular region posteriorly, and rarely may these signs be elicited over the infraclavicular region anteriorly.

The general clinical signs are often very insignificant. There is sometimes a slight rise in temperature, but usually it is weakness and general malaise, which attracts the first attention. Unless a careful examination is made, the symptoms are generally attributed to an influenza. Sometimes a small hemoptysis in an apparently healthy individual is the first symptom of the disease. There may be slight pain in the chest, probably due to an associated local pleurisy. This is indicated less by direct symptoms, than by the fact, that after pneumothorax adhesions are often found in these areas below the clavicle, the apices being entirely free. In presence of sputum, tubercle bacilli are frequently found.

Assmann looked upon the infraclavicular infiltration as tuberculous pneumonitis, i. e. an exudative process. This leads often to caseation and central necrosis. A central cavity is then usually observed within the Assmann focus.

Assmann also pointed out, that even in early cases there can already be found many evenly arranged, small foci around the primary lesion. He considered them to be small nodules originating from deposits of tubercle bacilli carried by the blood vessels and lymphatics. In further progressing cases there may be seen a continuous extension from the main shadow of the focus, and sometimes the appearance of similar isolated, round foci in other portions of the lung field, which are considered as aspiration metastses. This is the usual way in which

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a pulmonary phthisis may develop from the Assmann focus. Assmann made it clear, however, that he did not consider the early infiltration as the original lesion from which pulmonary phthisis develops in all cases.

It should also be remembered, that even in those cases in which these foci are the first apparent signs of pulmonary tuberculosis, they are not the true primary foci according to Ranke. They indicate a reinfection, such as may occur in a subject not entirely free from tuberculosis, yet one practically healthy. This reinfection may be either of exogenous or endogenic origin.

The prognosis in cases of infraclavicular foci is usually favorable. In neglected cases a disseminated fibro-caseous tuberculosis may develop.

In the first instance, a considerable resolution toward normal radiographic appearance may be observed. The shadow of such a focus may decrease in size, even the central cavities may shrink and finally disappear completely. This healing takes place partly through resorption of the exudative pneumonic process, and partly through fibrosis with subsequent retraction of the scar. Calcification of these foci may also occur.

If the process shows no tendency to retrogression, it may extend into the surrounding parenchyma; the cavities increase in size, aspiratory metastases appear, and we then are faced with a fully developed pulmonary phthisis.

The practical importance of recognition of the pathological substrate of the infraclavicular infiltration, lies in the fact, that by instituting an early treatment, the latter course may be prevented, and a complete recovery may be expected in the majority of cases.

Assmann's observations were also of great theoretical significance. In developing Assmann's thesis, Redeker in 1926 gave an elaborate description of the infraclavicular infiltrations, their development, relation to the tuberculosis of puberty and phtiseogenesis.

Redeker summarized his studies in the following conclusions:

1. The early infiltration is localized in the lateral infraclavicular region or in the middle lung field.
2. The infiltration is first detected on roentgen-examinations and not by percussion or auscultation.
3. Frequently enlarged nodes with perifocal inflammation are found.
4. There are no subjective complaints or objective signs, i. e. no cough, chest pains, or toxic symptoms. The initial stages of infraclavicular infiltration are therefore never recognized on physical examination, but are usually detected in tuberculous dispensaries on regular examinations of exposed, but not morbid individuals.

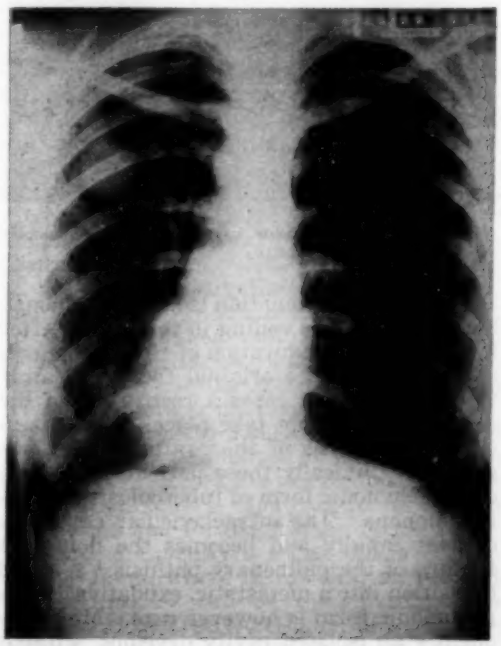

Fig. 1. Typical Assmann Focus in the left infraclavicular region.

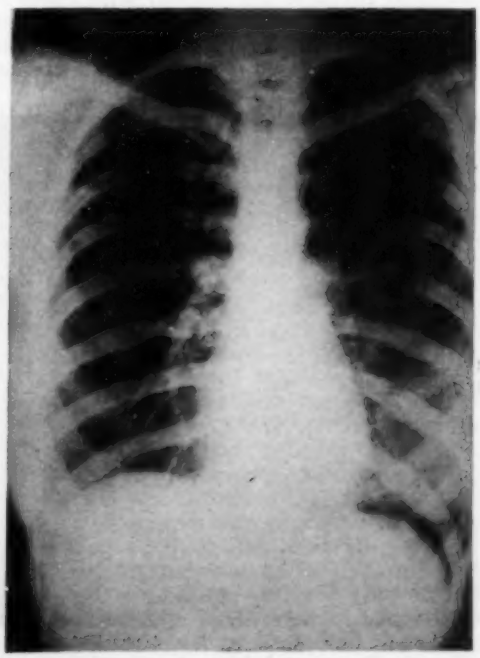

Fig. 2. Focus decreased in size after some resorption.

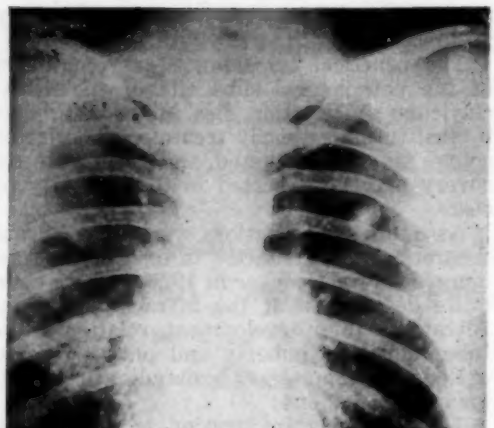

Fig. 3. Assmann Focus in the left infraclavicular region with central calcification.

5. The infraclavicular infiltration — "Assmann's focus"—develops predominantly in young individuals, between fifteen and twenty years of age, also in the next quintennium, only rarely later.

6. Very frequently an acute source of infection can be discovered.

The studies of the clinical course of infraclavicular infiltrations showed some cases to terminate in absorption of the infiltration or in subsequent fibrosis. In other cases, the infiltration increased in size and this was accompanied by elevation of temperature, general toxic manifestations, and occasionally hemoptysis. Roentgenograms of the chest invariably revealed central caseation and formation of a cavity. Sometimes fibrosis ensued, but more frequently the infection involved the surrounding parenchyma. The new foci were round, soft, and ill-defined. Redeker interpreted these new round foci as a perifocal reaction around a new small microscopic focus. It was the surprising ability of complete resorption of these metastatic foci, that caused him to assume this explanation.

After a bronchogenic spread, the infraclavicular infiltration does not present a round shape. The whole upper lung field is veiled. In absence of a cavity the origin from a typical localized infiltration cannot be recognized, unless it was noticed previously.

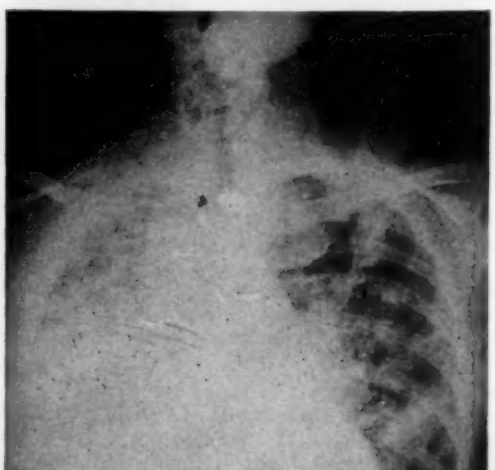

Fig. 5. Disseminated bilateral tuberculosis in the same case which showed originally an infraclavicular infiltration with a small cavity.

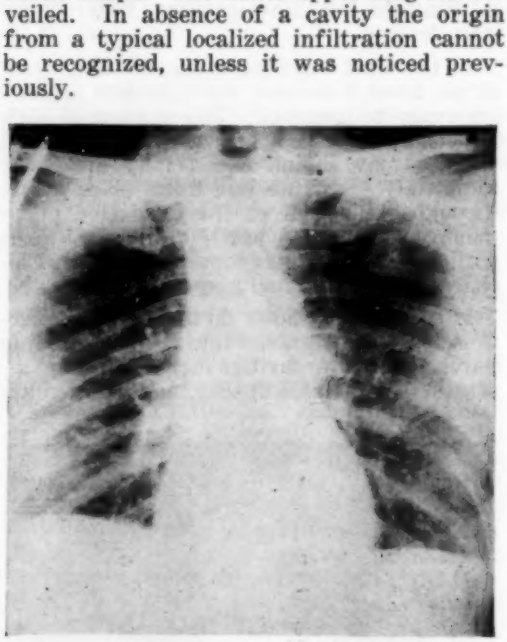

Fig. 4. Assmann Focus in the left infraclavicular region with a central cavity.

Perifocal inflammation is largely responsible for the diffuse veiling in this stage. After it subsides and induration of the larger metastases occurs, the original focus is plainly visible. In many cases a restitution of the metastases does not take place, and a caseation and necrosis of the confluent foci progresses. Clinically these patients present a caseopneumonic form of tuberculosis, phthisis gallopans. The infraclavicular cavity increases rapidly and becomes the dominant feature of the pulmonary phthisis. A rapid transition into a metastatic, exudative, caseopneumonic form is however rare. More frequently an isolated cavity develops, without morbid subjective symptoms, and ultimately the process becomes stationary. If an

acute recrudescence occurs, a sudden hemoptysis may be the warning signal or the spread may only show an increase of the size of the cavity. In some cases the cavity may shrink, and leave a fibrosis.

Redeker is of the opinion that the infraclavicular infiltration is the most frequent origin of the acute and chronic phthisis of adults. As regards the relations of the apical foci to the infraclavicular infiltration, Redeker calls attention to his repeated observations, that a typical productive or productive cirrhotic apical tuberculosis develops from an infraclavicular infiltration followed by an aspirative dissemination into the mid field and hilus. With further progress the caudal foci are resolved and the apical changes remain manifest in the roentgenograms.

In conclusion may we say, that in view of these investigations of the pathological substrate and clinical course of the "Assmann foci," they deserve proper attention of the clinician and roentgenologist. If early diagnosed and adequately treated, the prognosis is usually good. The failure to recognize an Assmann focus as a tuberculous manifestation, and to institute the proper treatment may lead to dissemination of the tuberculous process, which cannot be controlled by our present therapeutic measures.

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# Relationship of Spina Bifida Occulta To Back Injury*

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Since the advent of the X-ray and the taking of X-ray pictures of the lumbar vertebra, it has been obvious that there is a wide variance in the formation of the bony structure of this area. Various anomalies have been found and very adequately and definitely described. Heise in his article "Anomalies in the Lumbar Spinal Column" classified these various conditions as spina bifida of the sacrum, sacralization, lumbar ribs, and scoliosis. He found that in a series of 1,050 cases studied that 240 of these had spina bifida of the sacrum, or 22.58 per cent. He described this anamolous condition as a triangular defect, having its base superior toward the fourth lumbar vertebra; quite frequently the two halves of the arch of the first sacral vertebra are not completely united with each other. There are found various transitions and forms of spina bifida occulta; quite frequently a spina bifida occulta may be found where in the cleft an isolated spinous process can be recognized, which seems to float freely, actually, however, being united with the remaining skeletal tissues by cartilage or connective tissue. Other authors agree in the classification of this condition and the description of the anomaly. However, they vary considerably in the per cent found. It is not primarily the purpose of this article to establish the per cent of spina bifida occulta found, or to prove or disprove the findings of these men.

An honest effort has been made to collect data showing a definite relationship between the anomalies of the lumbo-sacral area of the back commonly called malformation of the lamina of the fifth lumbar vertebra and sacrum, and the susceptibility of the individual to injury in this area. In order to carry out this experiment, a large group of lead and zinc miners were examined, and their spines X-rayed. A diagnosis from the roentengraph was made, and these individuals were allowed to work for a period of five years. During this time a case record was kept of each accident sustained by this group of men, the amount of time lost by each, and the resulting disabilities ascertained.

The experimental group used belonged to

*Read before the Section on General Surgery, Annual Session, Oklahoma State Medical Association, May 7, 1940.

a laboring class of whom a great per cent make their living by hard physical labor. It was necessary for them to work carrying heavy loads, and shovel heavy rocks. They were all under-ground workers, and all men worked under similar conditions, but at different mines. All the injuries were treated by two men, Dr. Richard Russell and myself.

In determining the type of injuries that should be included in this survey, I decided that only those accidents that had no direct trauma would be used. All cases of fracture caused by direct blow to the back, or other direct contusions were eliminated. Only those cases in which the patient complained of having pain in his back during the time that he worked, or immediately following, and in those patients in which they either slipped or fell causing catching pain in the lumbar area of their back were considered. All types of accidents thus described, whether they were reported immediately or after several days, were included in this determination. There was no effort made to determine whether or not the patients were malingering or sincere.

In my observation over a period of several years, I have found that individuals who had these abnormalities in their backs did not appear to be any more susceptible to accident such as I have described, than the individual who had an approximately normal back. In many of the text books and in the literature, there has been a tendency for the profession to describe as a predisposed cause, the injury of these malformations. With this in mind I have set about to either prove or disprove this contention. This series was started on Novemoer 4, 1933, and was completed in July, 1938. Each patient was given a physical examination and anterior-posterior X-ray of the lumbar sacral area. All patients who were found physically fit for labor were allowed to work. None were discriminated against because of abnormalities in their back. They continued to work for the five-year period, with some exceptions, and were re-examined at intervals of one to two years. However, no further X-rays were made of their backs unless they complained of pain or had had some type of accident. The treatment given the patients who were injured was identical, regardless of whether or not there was an anomaly found in the back.

In differentiating between the so-called normal backs and the backs with an anomaly, different anomolous conditions were described and used as a basis for classifying these conditions. Spina bifida occulta of the sacrum with no evidence of a center of ossification and ranging from a minute opening to one of approximately one-half inch in diameter is one of the most common type. The large spina bifida occulta with a center of ossification representing the spinus process was a second type. The incomplete formation of a sixth lumbar vertebra with either sacrum on the left or right was not included in this group unless there was a definite evidence of an opening or a malformation of the lamina of this rudimentary vertebra. A series of photographs and X-rays reporting this condition are shown in figures. The X-ray pictures taken were all anterior-posterior flat plates, and were read from day to day.

In this series of 6,391, 820 anamolous backs were found, or a per cent of 12.85. This per cent ranges within the means of most per cents given by the authorities who set as an average, from 10 to 20 per cent. In this group there were found 728 generalized exostosis. A great number of this group were not allowed to work, but there was no differentiation made between patients with exostosis and spina bifida, so that it is reasonable to assume that the same relative number of patients with exostosis with spina bifida and without spina bifida were not allowed to work.

During this five-year period that these 6,291 men were allowed to work they received 3,412 accidents. Of this, 5.83 per cent were back injuries of the type I have described in the previous paragraph. The total number of accidents is rather high, but this work is considered hazardous, since a great per cent is underground. The 5.83 per cent due to back injuries does not include those accidents which may be attributed to direct trauma such as direct contusion due to either falling objects, or patients falling against their backs. It includes only those accidents in which the patients were doing their ordinary work and felt a sudden catching pain in the region of the fifth vertebra, which either forced him to discontinue working at the time, or became more severe at a later date. Whether or not it was necessary for him to stop work, he did report his accident and receive medical attention. It was not always necessary for the patients to discontinue working, but a certain per cent reported their accident and received treatment while performing their duties.

There was a total of 199 back injuries over this period of time. One hundred seventy-two individuals who had X-ray pictures made of their spines previous to their employment reported injury of the type which fell into the classification under consideration in this article. Of this number, 153 had no evidence of spina bifida abnormalities, however, a certain per cent of these had other abnormalities either due to trauma, infection, or anomalies. Of the total 172, 19 who had spina bifida reported accidents,

or a per cent of 10.13. From these figures it was determined that 10.13 per cent of all the individuals who reported accidental injury to the backs had spina bifida of the sacrum.

A further analysis shows that of the 153 cases with normal backs 39, or 20.27 per cent, had prolonged healing periods or eventually became cases for litigation. Of the 19 cases who had spina bifida, two, or 10.53 per cent, had prolonged healing periods. Of this entire group there are no cases at this time that have not returned to their ordinary manual labor, and who are working as satisfactorily as they did previous to their accident. In other words, of this entire 172 cases there is at this time none who has a total or partial disability to our knowledge. None of these cases was operated, and the treatment was conservative. Only a comparatively few were hospitalized. As was stated before, a certain per cent were treated while doing their regular work and lost no time as a result of their accident.

In reviewing this data it is obvious that the per cent of cases who had spina bifida correspond very closely to the per cent of individuals who were allowed to work with spina bifida. Furtherfore, it is obvious that the healing period is not prolonged because of this anomolous condition, and that the individual is no more susceptible to permanent disability than the individual who has a comparatively normal back. As a matter of fact, in our observation with this group of men it was concluded that this type of back injury does not tend to permanent disability. However, certain cases were rather stubborn, and healing periods were prolonged. A certain number of them fell into the hands of attorneys, and it was necessary for a certain period of litigation and settlement before the patients returned to their labor.

## SUMMARY

1. There has been a tendency in the literature to consider a common abnormality, spina bifida occulta of the sacrum, to be predisposing to injury and to a prolonged healing period following.

2. It was the purpose of this article to determine whether or not spina bifida occulta pre-disposes to a weakness of the spine.

3. Over 6,000 individuals were given physical examinations which included AP X-rays of the lubmo-sacral area, and all of these individuals were allowed to work.

4. An accurate record of the accidental injuries to these indviduals was kept over a period of five years. From this record it was determined that 172 patients who had been previously X-rayed received alleged accidental injuries to their lumbar spine.

5. It was determined from these physical examinations that 12.85 per cent of all the individuals had spina bifida occulta of the sacrum or fifth lumbar.

6. Of these 172 patients, 19, or 10.13 per cent had spina bifida occulta.

7. It was determined that 20.29 per cent of the cases with normal spines had prolonged healing periods or became cases of litigation as compared to 10.53 per cent of individuals with spina-bifida occulta.

Conclusion: This record leads one to conclude that spina bifida occulta is not a predisposing cause for simple back sprain, and that it does not effect a prolonged healing period in individuals who have received injury to their spine.

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# The Use of Sulfapyridine and Allied Drugs In the Treatment of Pneumococcus Pneumonia*

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Whitby,[1] by his epochal making discovery in 1938 that mice could be protected from the pneumococcus with sulfapyridine, gave the medical profession a potent weapon for lowering the mortality of pneumonia. Soon after Evans and Gaisford[2] reported excellent results in treating one-hundred cases of pneumococcus pneumonia with sulfapyridine, numerous reports have followed.[3-4-5-6-7] The mortality has been lowered from around 34 per cent to 6-9 per cent for pneumonia caused by the pneumococcus.

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Sulfapyridine also is of value in treating staphylococcus, streptococcus and influenza bacillus infections. Most cases of pneumonia are caused by either the pneumococcus or one of the above. In this list may be included the post-operative pneumonias which, according to Hinshaw,[8] respond favorably to sulfapyridine. For these reasons treatment should not be delayed if the physical and x-ray signs point to pneumonia.

The initial dose in an adult is usually three to four grams. Some men start with two grams and repeat the same dose at the end of two hours. Following the initial dose, one gram is given every four hours until the temperature has been normal for thirty-six to forty-eight hours. The dose may then be cut to one gram every six hours and from then on to one gram t.i.d. and so on until the drug is stopped. The blood level of sulfapyridine is important and should be watched daily. The above dose will as a rule give a level of between 2—10 mg. per cent. 4—5 mg. per cent is probably about an average blood level and is usually adequate. Patients will sometimes die with greater blood concentrations and sometimes live with lower blood levels.

Sulfapyridine is equally as valuable in treating children who have pneumonia. Authors differ a little in their dosages. Long[9] gives .5 grams—2 grams as an initial dose and follows this with .25 gm.—.5 gm. every four hours depending upon the weight of the child. He likes to have the blood concentration 4 mg. per cent or more. Friedenwald[10] gives 1—1½ grains of sulfapyridine per pound of body weight each twenty-four hours starting with a large initial dose. In children under six a 7½ grain initial dose was given, followed by 3¾ gr. every four hours. If the children were over six, fifteen grains was given as an initial dose and followed by 7½ grains every four hours. The average total dose was 80 grains with a minimum of 15 and a maximum of 150 grains. With these dosages blood levels of between 5 and 10 mg. per cent could be obtained and maintained.

The action of the drug is bacteriostatic rather than bacteriocidal. Susceptibility of different strains to sulfapyridine vary as Long[11] and MacLeod[12] have shown. Some strains are what is termed sulfapyridine fast and are not inhibited by the drug. This characteristic can be passed on through several generations by culturing or inoculating laboratory animals. This condition can be produced in patients by giving insufficient amount of the drug.

Sulfapyridine occurs in the blood as a free and a conjugate form called acetyl sulfapyridine. The conjugated salt is inactive. 40-80 per cent of the sulfapyridine at times becomes conjugated according to Long.[7] 51-82 per cent of the entire drug is eliminated in the urine and the rest in the feces. The conjugated form is in higher concentration in the urine and is also insoluble, sometimes the crystals precipitate out, coalesce and form calculi which are non-opaque to the x-ray.

Definite improvement should begin after 24-48 hours of sulfapyridine medication. The white count drops about 24 hours later. If improvement does not begin in this period of time, one should think seriously of using specific serums. Because serum may have to be used, it is advisable whenever possible to determine the type of infecting pneumococcus. Sulfapyridine is of no value in the complications of pneumonia.

Toxic symptoms and complications have been reported due to sulfapyridine. Nausea and vomiting, which are central and local reactions, are the most common occurring in nearly 90 per cent of cases. The giving of Soda bicarbonate has been recommended for this. Also the giving of milk or giving the sulfapyridine in applesauce, etc. has been tried. Anemia is probably the next most common complication and may become so severe that the drug has to be discontinued. Many patients become irrational and have the sense of unreality while taking the drug. Other complications are dermatitis, fever due to the drug, leukopenia, methemoglobinemia, nephrosis and urinary suppression with calculi formation and numbness and tingling of the extremities. The drug should be withheld from those with a history of previous toxic reactions to either sulfanilamide or sulfapyridine and stopped if marked anemia, leukopenia, jaundice, hematuria, drug fever or rash developes. Tsas[13] and associates recommend cystoscopic examination and passage of catheters up the ureters on all cases of anuria. More than likely the anuria is being caused by the plugging of the ureters and kidney pelves and calyces by sulfapyridine calculi. The calculi can be rather easily washed out with irrigations of warm water.

Sulfapyridine may be given intravenously, intra-spinously or subcutaneously by a method devised by Haviland and Blake.[14] They found that sulfapyridine could be dissolved most easily by using 2 grams of the drug in a liter of aliquot parts of normal saline and 5 per cent glucose that has been brought to a boil. They recommended spacing the medication so that 6 gms. was given the first 24 hours and 4 grams each 24 hours thereafter.

In severely ill patients and patients who are vomiting, one may feel that the drug of choice is sodium sulfapyridine. The dosage[15]

recommended for this drug is 0.05—0.06 grams per kilogram of body weight. The dose is weighed out and dissolved in enough water to make a 5 per cent solution. The resulting solution is unstable to heat so cannot be boiled, is isotomic, alkaline and can only be given intravenously because it is very irritating to the subcutaneous tissue. The same dose should be repeated in 4-6 hours and again for a third dose if needed. Rarely are more than two doses needed. 5 c.c. a minute is the rate of injection recommended. At the same time as the intravenous injection is started, begin sulfapyridine by mouth giving 1 gram every four hours. Sodium bicarbonate in amounts equal to the amount of sodium sulfapyridine administered should be given. This method will raise the blood level to an effective point rapidly. The sodium ion is soon split off leaving sulfapyridine in the blood. Its fate has already been discussed. The intravenous route does not eliminate nausea and vomiting. Sulfapyridine can be recovered from the gastric contents soon after an intravenous injection. There are no incompatibilities with other drugs but still Long[15] does not use saline cathartics. There is no lowering of the $CO_2$ combining power and hence no production of acidosis. The contraindications to the use of the sodium salt are the same as for sulfapyridine.

Recently two other sulfanilamide derivatives have been added to our armamentarium, namely, sulfathiazole and sulfamethylthiazole. Sulfathiazole is about equal in efficiency to sulfapyridine in pneumococcus infections and a little better in staphlococcus infections. In man it is more readily absorbed and excreted faster than sulfapyridine (considerably less of it appears in the urine in the conjugated form). Because of the rapidity of excretion a constant blood level is difficult to maintain. There is less nausea and vomiting with sulfathiazole but more cases of drug rash and fever reactions occur. Occasionally it will cause injection of the sclera. Long had several cases of mild hematuria and one case of anuria. There was no decrease in the $CO_2$ combining power of the blood. The dose recommended is 4 grams to start with followed by 1 gram every 4 hours.

Flippin[17] in reporting his cases at the meeting of the American College of Physicians in Cleveland found the two drugs, sulfathiazole and sulfapyridine, about equal in efficiency in treating pneumonia. Sulfathiazole did not produce as much nausea and vomiting nor as many cases of blood dyscrasias or renal complications as sulfapyridine. He gave an initial dose of three grams, repeated it in four hours and then gave one gram every four hours thereafter. He continued that treatment until the temperature was normal for 48 hours, usually giving 25-40 grams in all. With the sulfathiazole he recommended giving equal doses of sodium citrate. When necessary he gave sodium sulfathiazole intravenously in a 5 per cent solution giving .06 gram per kilogram of body weight. As a rule a single dose was all that was necessary.

Dubos at the last meeting of the American College of Physicians reported his interesting work. He has been able to extract an enzyme that is formed by bacteria growing in soil which will dissolve the capsules of the pneumococci. The enzymes are specific, only type III enzyme acts on type III pneumococci, etc. They act both in vitro and in vivo but as yet have not been put to clinical use on human beings.

In conclusion, I would urge and recommend the use of sulfapyridine or sulfathiazole in the great majority of pneumonia cases. The dangers from its use are not great if one uses reasonable care and judgment in prescribing it. My own experience with its use is not great but the results are comparable to those reported by others. Instead of now dreading pneumonia we can attack it with more than just symptomatic treatment and hope.

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## DISCUSSION


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### *The Use of Sulfapyridine and Allied Drugs In the Treatment of Pneumococcus Pneumonia*

Chemotherapy is certainly coming into its own in the treatment of infectious diseases. The lay press is extolling its virtues and anyone not using it in every case is considered by the laity as an old fogey. Chemotherapy was dramatically called to public attention when Ehrlick in 1904 developed what he

thought was the sterilissimus magna, a drug that would kill the parasite or bacteria, and at the same time not cause too much damage to the host.

Mercurochrome was lauded as being a panacea, but it seems to have gone the way of all flesh. Now these azo dyes are the stylish ones. They started with Prontosil (1908) neoprontosil, sulfanilamide, sulfapyridine and sulfathiazole in quick succession, all being like a yearly model of an automobile, which is being put out before you know how to manage the older one, an innovation being thrust upon you. These chemicals have a good and a bad side—and the toxic effects reaching practically every organ with its protean symptoms. Neoprontosil is possibly the least toxic and again the least effective, but we are able to supplement the sulfanilamide or —pyridine by the neoprontosils, when the blood level is not high enough and toxic symptoms are manifested. Sulfapyridine in my hands can hardly be held to therapeutic doses until it manifests toxic symptoms. It is chemotaxic to certain groups of the pneumococci and needs serum as a supplemental measure in groups I, II and VII, or the vis medicatrix matura to supplement it in other types, hence let us not discard serum therapy with its specificity, when we are dealing with these types. Fluids should be limited while using these dyes so as to concentrate the chemical in the blood stream. How it acts is only known empirically as too many theories are advanced. Certainly its concentration in the blood stream is not strong enough to kill the bacteria in vitro as it evidently acts by preparing the capsule of the pneumococcus and the antibodies do the rest. This theory cannot hold good when dealing with the streptococcus group.

At the College of Physicians meeting in Cleveland, we were told that sulfathiazole was equally effective and less toxic, but yet is not commercially available, so its qualities have yet to be evaluated.

The essayists warn that the patient should be hospitalized or at bed rest and under the care of a very observant physician. A federal law becomes effective July 1, which will not permit these azo dyes and barbiturates to be sold over the counter without a prescription, so they may stop the indiscriminate sale of a drug which has its virtues, but unfortunately also has a very sinister side.

The question is, will it have a place in the firmament next year that it has this year.

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# Thiamin Chloride: Its Indications and Methods of Use*

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New developments in the field of vitamin therapy during the past two or three years have progressed at such a delirious rate, that it seems difficult, if not hopeless, to establish definite lines of thought in regard to the application of these various food accessories. There is little doubt that they constitute a very necessary factor to normal nutrition and that most important deficiency diseases are caused by insufficient vitamin intake over long periods of time.

Thiamin chloride, since its successful synthesis by Williams in 1936, is commanding an ever increasing interest in the field of vitamin therapy, due to the growing realization of its fundamental importance to all living processes. Williams and Spies state, that since it is indispensable to higher animals, insects and for higher plants, it surpasses all other known specific substances in the scope of its biochemical significance. Riboflavin is probably its nearest competitor in this respect.

The great volume of literature which has accumulated during the past few years amply bears out the statement of these authors, and at the same time, has caused considerable confusion regarding the practical application of a very essential food factor. Numerous writers have reviewed its chemistry and physiology, which is quite complex, and will not be dealt with here. It is absorbed from both the small and large intestine with a wide range of variation, according to Cowgill, depending upon individual idiosyncrasy, the form in which it is ingested, the presence of other materials in the bowel and the state of intestinal function particularly in regard to motility. It is excreted in both the urine and feces, and attempts have been made to determine the vitamin B1 content of the blood, but little accurate information is available to date as to what constitutes normal blood levels.

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## PATHOLOGY

The important morphologic changes which have been observed in B1 avitaminosis in advanced states, such as beriberi, are usually considered under three headings, namely: 1. The nervous system. 2. The heart. 3. Edema (Williams and Spies).

THE NERVOUS SYSTEM: Degenerations of the nervous system are generally considered as among the most characteristic manifestations of vitamin B1 deficiencies. These include degeneration of the myelin sheaths and fragmentation and atrophy of the axis cylinders in the spinal cord, and peripheral nerves. Degenerative changes have also been observed in the sympathetic nervous system.

Many investigators have questioned the specificity of these nervous system lesions (Davison and Stone: Engel and Phillips, et al.) chiefly because of the observation that lesions which cannot be distinguished from those believed to be due to thiamin deficiency have been found in birds and rats, subjected to inanition.. Loss of appetite occurs early in vitamin B deficiencies and may lead to inanition. However, as Vedder points out, human subjects with beriberi are often well-nourished and it seems difficult to attribute these phenomena to inanition under such circumstances.

THE HEART: The pathology of the heart in B1 deficiencies is indefinite and would seem to be largely functional as the result of poor myocardial tone. In severe cases death has resulted from ventricular failure but in the vast majority of cases the heart has been enlarged to the right or left and exhibits varying degrees of myocardial failure. These changes are reflected in the electrocardiogram and careful clinical judgment should be exercised to avoid serious errors in interpretation.

Dry and wet forms of beriberi have been described depending on whether edema is present or absent. The edema is usually first observed in the lower extremities and may progress to general anasarca. The fluid is characteristically of the transudate variety, with low protein concentration and low specific gravity.

## FUNCTION

Thiamin, according to Williams (2) seems to possess an almost universal function in living cells. Its action seems to be exerted through its participation in several enzyme systems the most important of which has to do with the normal disposal and utilization of pyruvic acid, an intermediary product in carbohydrate metabolism. Largely due to the work of Peters and his associates, it is generally believed a characteristic feature of vitamin B deficiency is a diminished oxygen intake and a resulting accumulation of pyruvic acid in the tissues, particularly in the brain. It is essential for the normal metabolism of all cells, and may produce conspicuous defects in whatever tissue or organ happens to be congenitally subnormal in function, or to have been impaired by disease or other unfavorable circumstance. Its action is evident only in the presence of vitamin B deficiency, according to Molitor and Sampson.

## FOOD SOURCES

Vitamin B1 is found in a wide variety of foods and curiously enough, is not contained in any one food in large amounts. Vegetables of all kinds, milk, eggs, fruit and meat are common sources. It has been found to be quite stable to heat.

## CLINICAL STATES IN WHICH THIAMIN CHLORIDE IS INDICATED

It is impossible, due to the far-reaching scope of clinical indications of thiamin, to cover this phase completely. Therefore, to avoid confusion, and to keep within the scope of practical application as far as possible, an attempt will be made to group the indications mentioned under four headings, namely: 1. The nervous system. 2. The heart. 3. Gastro-intestinal. 4. Metabolic.

NERVOUS SYSTEM: Thiamin is essential to the normal function of the nervous system, and as far as the writer has been able to determine to date, it is indicated in practically any form of general or localized neuritis. Some of the commoner forms of nervous system involvement which have yielded to thiamin therapy may be enumerated, and consist of clinical states such as the following: Polyneuritis which occurs in chronic alcoholic states; neuritis associated with toxic factors (heavy metal; endogenous) and inflamitory origin (Vorhaus); the polyneuritis of pregnancy; generalized neuritis secondary to gastro-intestinal disturbances such as pyloric stenosis incident to peptic ulcer; short circuiting operations of the intestinal tract. Its use is indicated in, and has been reported as of great value in such conditions as multiple sclerosis, degenerations of the pyramidal system of unknown etiology, and in many other forms of localized neuritis such as is found in cases of pain of ischemic origin (Naide.) It is interesting to note that while there is no evidence of the existence of vitamin B1 deficiency in cases of rest pain, daily doses of 100 mg. given intravenously relieves the pain, and it was necessary to keep these patients on maintenance doses to prevent its return.

Vitamin B1 does not supplant the usual methods of treating peripheral vascular disease, and measures to relieve peripheral circulation should be used in these cases.

Borsook, et al, have during the last year reported a study of the effects of massive doses of thiamin on the pain in major trigeminal neuralgia, and also in cases of sphenopalatine neuralgia and other types of atypical neuralgia. Large doses of thiamin, ranging from 10 to 100 mg. daily were given intravenously and in most cases supplemented with 30 cc. of an aqueous solution of rice polishings added to a high-vitamin low carbohydrate diet. The results of treatment in these cases showed an improvement in a sufficient number to warrant its continuance, although this improvement showed a wide variation, and these authors feel they are at present unable to evaluate the relative contribution to the relief of pain of the vitamin B complex. They state, however, that it appears to be thiamin.

In this connection it is interesting to observe the variable results obtained by the use of thiamin in a variety of pains encountered in medical practice, such as para-orbital neuralgia of undetermined origin and the facial pains which frequently accompany chronic maxillary sinusutis and ethmoiditis. Thiamin should be given a trial in increasing dosage in these types of pain but one should not overlook the presence of specific causes and their removal when possible.

Johnson, in a small series of cases, suggests the value of thiamin chloride in the treatment of tobacco (toxic) amblyopia, and Ochner and Smith have recently reported favorable results in cases of painful varicose ulcers by the administration of 1500 units of thiamin three times daily. This dosage should be doubled if the symptoms do not subside in three or four days. Stern, reporting a series of 28 cases in which 120 intraspinal injections of thiamin chloride in doses ranging from 1 to 100 mgm. was given, regards this vitamin as having a very powerful rejuvenating action unknown to any other drug, and as being of great value in relieving intractable pain in cases of inflammatory and degenerative diseases of the central nervous system.

There are numerous and sundry other indications involving the nervous system where relief has been claimed through the use of this vitamin. Time does not permit discussion of them.

HEART: The outstanding characteristics of vitamin B1 deficiency in heart disease are, according to Wood, peripheral vasodilation and right ventricular failure. The former is evidenced by warm skin, capillary pulsations, pistol shot sounds over bounding major arteries, and low diastolic pressure. Signs of right ventricular failure are elevated venous blood pressure, enlarged and tender liver and dropsy. Patients exhibiting the above symptoms should be questioned regarding dietary restrictions over a long period of time. Electocardiographic changes have been reported by Dustin, et al, in patients exhibiting clinical signs of vitamin B1 defeciency and are very similar to those changes found in myocardial infarction. Extrasystoles of a functional character will often respond promptly to thiamin therapy in a way that is still not fully understood. Cases of this nature are seen quite often in ordinary medical practice and warrant careful consideration because while a majority are of no serious significance, it has only recently been possible to ascribe a definite neurogenic origin to them. In other words certain nerve tracts coming from the hypothalamic area seem to be involved in the production, in some instances of extraventricular systoles.

GASTRO-INTESTINAL SYMPTOMS: According to Cowgill, there is considerable evidence that lack of vitamin B does not cause any specific dysfunction of any portion of the gastro-intestinal tract. Symptoms which are commonly observed in patients with vitamin B1 deficiency, are anorexia, glossitis and diarrhoea. The pathogenesis of these symptoms is doubtful. Evidence has accumulated, both pro and con, regarding the relationship of vitamin B1 specificity in such clinical states as peptic ulcer, gastric and intestinal atony, spastic colon, hypochlorhydria and the like. There is no doubt that poor appetite is a prominent symptom in B1 deficiency and the response to thiamin therapy is striking. There seems little doubt that motility of the intestinal tract is increased by thiamin as is evidenced frequently by the establishment of normal bowel movements by small oral doses. However, the action of Riboflavin should not be overlooked here as the complex is more effective than thiamin alone.

METABOLIC: As stated by Cantarow, it has long been known that an abundant carbohydrate intake hastens the development of polyneuritis in B1 avitaminosis. Also that the substitution of certain fats lowers the vitamin B requirements. The essential nature of the disturbance in carbohydrate metabolism in vitamin B1 disturbances consists as has already been mentioned under function, of the accumulation of pyruvic acid in excess in the tissues and body fluids. Administration of adequate amounts of vitaman B1 in the preoperative preparation of hyperthyroid patients has been reported as being beneficial (Frazier and Ravidin). These authors feel that patients can be prepared for operations in a shorter time, and show a more rapid fall in heart rate. It is suggested that the tachycardia in these cases may be due in part to a lack of vitamin B1.

Other metabolic disturbances have been mentioned, such as anemia, anhydremia, etc. Nothing definite is known of the biochemical connection of these states with thiamin deficiencies.

### REQUIREMENTS

In regard to vitamin B1 requirements of the human body, it may be stated that the Technical Commission of the League of Nations Health Committee has made the following recommendations: An allowance of 10 I. U. per 100 calories of food intake seems to be adequate for adults. The diets of pregnant and lactating women should contain 20 to 30 I. U. per 100 calories. Infants should receive 10 to 15 I. U. per 100 calories and 200 to 250 I. U. daily is probably sufficient for children of nursery school age. Factors involved in increased requirements of B1 which may be mentioned as of importance are increased metabolism due to long continued fevers; faulty assimilation as represented by such states as ulcerative colitis, protracted diarrheas and carcinomas of the stomach. Increased elimination as found in polyuria of diabetes mellitus may also create an increased requirement.

### METHODS OF USE AND DOSAGE

Vitamin B1 may be given either in the form of pure crystalline thiamin or as Brewers yeast, plain or autolyzed. The crystalline thiamin may be given intravenously, intramuscularly or orally depending on the clinical state for which it is being used. As in any other therapy the most effective method is to give it intravenously or intramuscularly until the deficiency is overcome, or until clinical improvement has taken place, and then resort to maintenance doses given orally. As has already been mentioned, it has been given in large doses intraspinally in certain central nervous system disturbances with no untoward reactions. Maintenance doses have been stated to be about one to two milligrams daily. Doses of 100 milligrams have been given intravenously with no ill effects. Toxic symptoms are tremor and muscle spasms and respiratory failure.

### SUMMARY

A review of the more recent literature on thiamin chloride is reported. The important morphologic changes in thiamin deficiency have been enumerated together with some of the more common clinical states in which it is indicated and the methods of use and dosage are discussed.

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## DISCUSSION

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LAWTON, OKLAHOMA

### *Thiamin Chloride: Its Indications and Methods of Use*

In order to discuss intelligently the excellent paper Dr. Rewerts has presented on such a vital subject as thiamin chloride, one should be able to combine personal experience and a knowledge of the literature dealing with its many phases.

Lacking the former, to any great degree, except as, no doubt, most of us have, who have used thiamin chloride for a variety of indications, based on its widespread possibilities, I hope you will pardon me if I may repeat and perhaps emphasize some of the points mentioned in the paper.

Although, as stated, there may be few *specific* indications for vitamin B therapy, the extraordinary claims for the therapeutic efficacy of this vitamin have created tremendous lay as well as scientific interest.

Thiamin chloride is known as the anti beriberi or anti neuritic factor of vitamin B, yet it is recommended in various other disturbances of the nervous system; namely, neuralgia, alcoholic psychosis, tabetic lightning pains, multiple sclerosis, trigeminal neuralgia, herpes zoster, alcohol-tobacco amblyopia, irradiation sickness, cardiavascular dysfunction secondary to alcoholic neuritis and anorexia.

A clearer conception of the real nature of vitamin deficiencies is one of the modern achievements of medicine. Of chief interest, in its relationship to neuritis, is the anti neuritic vitamin B. Neuritis of this kind is observed in many diseases such as gastric carcinoma, mal-functioning gastroenteric stroma, obstructive duodenal ulcer, tuberculosis and in prolonged vomiting and malnutrition resulting from unwise diets in cases of normal, alcoholic, hysterical and psychotic patients.

The paper speaks of the fact that human subjects with beriberi are often well nourished, questioning the condition of inanition as related to thiamin deficiency. Might it

not be possible that in some cases, the muscular atrophy is obscured by the edema and that when one of these so-called cases of wet beriberi begins to loose the subcutaneous collection of fluid, is the true state of inanition revealed.

As was mentioned, vitamin B deficiency causes a diminished oxygen intake and resulting accumulation of pyruvic acid in the tissues. The laboratory determination of the blood pyruvic acid concentration as an indication of vitamin B deficiency offers a wide field for further research in this problem.

Thiamin deficiency most commonly manifests itself as poly neuritis. Should vitamin B deprivation continue, symptoms increase and group themselves under alimentary, peripheral nervous and cardio vascular symptoms.

Changes in the alimentary tract produce altered motility, which results in anorexia, nausea, vomiting, diarrhaea or constipation. The latter, in part at least, may be due to the bulky carbohydrate diet which the average patient consumes who is suffering from this malady.

Myelin degeneration of the peripheral nervous system leads to signs and symptoms of peripheral neuritis.

Cardio vascular manifestations are tacchycardia, palpitation, dyspnoea and substernal or precordial pain. The pain may be quite as severe as that experienced in angina pectoris. The cardiac symptoms are paroxysmal and are the chief cause of death in beriberi.

Deficit in vitamin B may result from an insufficient intake of this vitamin or from poor assimilation. The condition under which a normal intake becomes relatively insufficient are infectious or toxic states, cachexia, pregnancy or lactation, strenuous work, a diet rich in carbohydrates and in general by an increase in the general metabolism.

A deficient utilization of vitamin B occurs in the presence of hepato digestive trouble, especially atrophic gastritis with hypechlorhydria or achlorhydria.

The discovery of vitamins and their relation to disease has been an outstanding contribution to medical science. With enthusiasm the physician has added them to his armamentarium.

Fortunately it has been shown that, although 20 to 50 mg. of vitamin B may be an adequate therapeutic dose, 90 to 100 mg. can be tolerated without apparent harm. With this latitude of safety, the physician may feel safe in ultilizing such doses as may be necessary for therapeutic effect.

### Conservative Approach to Sulfapyridine Use

A more conservative approach to the use of sulfapyridine, especially as to dosage in the treatment of pneumonia and more discrimination in substituting it for sulfanilamide in treating other infections are advocated by W. Hurst Brown, D.M., M.R.C.P., William B. Thornton, M.D., and J. Stuart Wilson, Toronto, Ont., in *The Journal of the American Medical Association.*

In their study of the toxic or poisonous reactions of sulfanilamide and its derivative, sulfapyridine, the three men found that the latter is essentially more toxic than its parent drug and also that there is a narrow range between the blood concentrations of sulfapyridine which combat infection and those which carry an unwarranted risk of serious toxic reactions.

They point out that: "Clinicians have not yet reached agreement as to the blood concentrations of sulfapyridine that are adequate to control pneumonia of pneumococcic origin. Until matters of such fundamental importance are settled, expediency should be tempered by caution.

They believe that high concentrations of sulfapyridine in the blood should be avoided unless it is certain that lower concentrations are not controlling the infection. The highest concentrations, they say, should be reached at the very beginning of treatment and should be reduced after a short period of maintenance. Since elimination of sulfapyridine takes place through the urine, toxic reactions may often be avoided by giving enough fluids to insure an adequate volume of urine.

In an analsys of 100 cases treated by each drug, the authors pointed out: "Serious toxic manifestations were found twice as frequently in patients treated by sulfapyridine as compared with the series on sulfanilamide. Patients treated with intensive doses and in whom high blood concentration of sulfapyridine were attained showed a very high incidence of serious reactions."

Serious and fairly common complications following intensive sulfapyridine treatment, particularly when the concentrations in the blood are high, are retention and inadequate secretion of urine and blood in the urine. "Although a decrease in white blood cells occurs more frequently in the sulfapyridine series and especially when the dosage is heavy, it is also encountered in both series and may occur when the doses are small or treat ment is of short duration," the authors say.

"Sulfapyridine may remain in the liver in small quantities for as long as forty days after chemical treatment has been terminated. No conclusion has been reached as to whether sulfapyridine causes inflammation of the liver."

The authors emphasizes that the vomiting often accompanying sulfapyridine treatment is not always a minor complication but may cause great discomfort, amounting even to agony. "It may be too much to say that the frequency with which the body is impelled to resist the retention of sulfapyridine should at once raise the question of its essentially toxic character, but the protest must at least be significant," they say.

### Pan American Tuberculosis Congress

The fifth Pan American Congress of Tuberculosis will be held in Buenos Aires and Cordoba, Argentina, October 13-17, under the presidency of Dr. Gumersindo Sayago, Cordoba. The official subjects of discussion will be: Evidences of tuberculization of the South American countries, heredity and contagion in tuberculosis, and the pulmonary aspects of the extrathoracic forms of tuberculosis.

### Adult Human Pulse Rate Is Variable

"The adult human pulse rate is considerably more variable than many persons think," *Hygeia, The Health Magazine* declares.

"Extensive and exact studies of the measurement of the heart rate of persons in New York City have shown pulse rates ranging from 55 to 120 beats per minute in a healthy person in a normal twenty-four hour cycle."

# • THE PRESIDENT'S PAGE •

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## *GROUP HOSPITAL SERVICE*

G. H. S.—Group Hospital Service—is a mutual non-profit organization sponsored by your State Medical Association and the Oklahoma State Hospital Association. It is the only hospital plan in Oklahoma having these two organizations' endorsement. Every county medical society as well as every individual doctor I am certain will give G. H. S. their wholehearted support.

Early in 1939, the need for a financially sound and strictly non-profit hospital plan had evidenced itself to the Council of the Medical Association. Through the efforts of a committee appointed from both the Medical and Hospital Associations, augmented by interested philanthropic lay individuals, the present plan of G. H. S. was formulated. This committee's work over a ten-month period in studying different successful plans in operation throughout the country has been rewarded in the success and sociological job being accomplished by Group Hospital Service.

G. H. S. has been in operation since April of this year and, of necessity, its original activities were confined to Tulsa and Oklahoma Counties because of the concentrated population in these areas. It is gratifying, however, to report that in the last two months. G. H. S. has taken its service into thirteen other counties of Oklahoma for the betterment of community health and happiness.

You should consider Group Hospital Service an activity of your Association and as such assist in bringing its activities into your community. You are backing it; now start boosting it. It is already a success, but your individual and collective efforts can make it a greater success. Boost Group Hospital Service.

Henry N. Turner

*President.*

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# EDITORIALS

## MEDICAL PREPAREDNESS

In recognition of the ominous implications of the second great world war in less than three decades, and in preparation for a national emergency which might at any time threaten our peace and integrity, and our personal liberty and prosperity, the House of Delegates of the American Medical Association at its recent meeting in New York City passed appropriate resolutions providing the necessary machinery to facilitate prompt mobilization of the members of the medical profession and to make available all allied services, such as medical education, hospitals, etc.

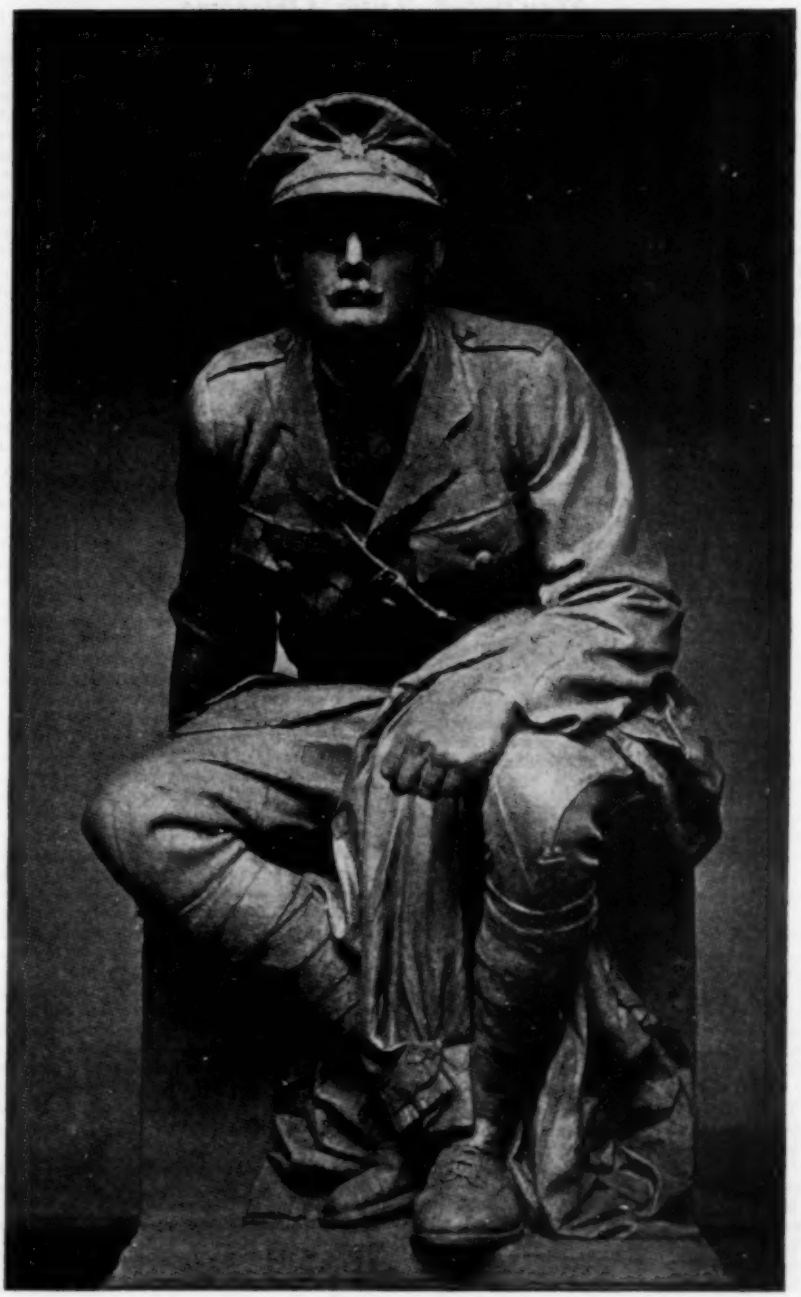
A Committee on Medical Preparedness was appointed with Dr. Irvin Abell as Chairman. The Oklahoma State Medical Association and its County Societies as units of the American Medical Association, should be ready if and when the call comes. The will to serve should be unanimous, the response to the call should be accompanied by a willingness to go anywhere and serve in any way that seems best. Naturally this presupposes careful organization and individual classification and rating according to general fitness, special training and experience. It should not be forgotten that medical preparedness must take into consideration Civilian Medical Service and Public Health, as well as the requirements of the Army and Navy.

In case the call comes, we would do well to emulate our neighbors in the Canadian Medical Association. At the New York City meeting of the American Medical Association, Dr. T. C. Routley, speaking for the Canadian Medical profession said: "When our country entered the war, our association did just what you would do here under like conditions. We told the government that we were prepared to assist. Within three days we had mobilized the medical profession of Canada. Ninety per cent of our profession volunteered their services, and of these 90 per cent volunteered to go anywhere or do anything that might be required." (1)

The accompanying athletic figure represents the work of Dr. Tait McKenzie (2), a Canadian physician who, with the touch of a Greek sculptor, employs his knowledge of anatomy in the portrayal of human grace and beauty. His beautiful war memorials in England and Scotland are now being threatened by the destructive implements of modern warfare.

The sculptured soldiers presented here might well represent the highest type among our own young men. If the call should come they will merit the best the medical profession can give. Fortunately doctors go to war, not to destroy, but to save life.—L.J.M.

* (1) Jr. A.M.A., June 22, 1940. Vol. 114, No. 25, U. 2474.
(2) "The Volunteer."



THE VOLUNTEER *Rosamond War Memorial, Almonte, Ont., Canada*

# Proceedings of the House of Delegates
## Oklahoma State Medical Association
## *May 6-7-8, Tulsa, Oklahoma*

The following transcripts of the three meetings of the House of Delegates, in Tulsa, May 6, 7 and 8 have been edited. All actions by the House of Delegates have been included, but should any member of the Association desire more detailed information on any action of the House, it will be immediately furnished by the office of the Executive Secretary, 210 Plaza Court, Oklahoma City.

Since the first two meetings of the House of Delegates were devoted exclusively to the reading of reports, the introduction of resolutions, election of officers, and the adoption of the amendments to the Constitution and By-Laws, and since the new Constitution and By-Laws are being printed to be sent to all of the component county societies, a complete recording of the Constitution and By-Laws will not be made in these minutes. The attention of the members of the Associntion, however, is directed to the rewording that will occur in some sections of the Constitution and By-Laws that is different from the original drafts sent to the county societies for study prior to the Annual Meeting. However, in no instance is the intent or purpose of the section changed. The rewording is only for the purpose of clarification. All resolutions adopted will be printed in full in the August issue of The Journal.

### MONDAY, MAY 6

The House of Delegates of the Oklahoma State Medical Association convened in the Crystal Ballroom of the Mayo Hotel in Tulsa at 8:30 p. m., with Dr. J. D. Osborn, Speaker of the House, presiding.

The Speaker opened the meeting by announcing committee appointments. These were: Credentials Committee—Dr. McLain Rogers, chairman; Dr. C. P. Bondurant and Dr. W. S. Larrabee; Resolutions Committee—Dr. H. K. Speed, chairman, Dr. O. C. Newman, and Dr. Ned R. Smith; Sergeants-at-Arms, Dr. James Stevenson and Dr. P. M. McNeill. The Credentials Committee was requested to report, and after taking a roll call, a quorum was declared present.

Dr. Osborn next made the announcement that the chair would only accept main motions, resolutions and important instructions from the floor that were made in writing.

The next order of business was the reading of the minutes of the previous meetings. Dr. Willour moved, and Dr. Larrabee seconded the motion, that since the minutes had been published in The Journal, their reading be dispensed with. The motion carried.

The Speaker then called upon the President, Dr. W. A. Howard, to read his report. Upon completion of the report, it was moved by Dr. O. E. Templin and seconded by Dr. J. A. Walker that the report be adopted. The motion carried.

The Speaker next read communications from other state societies that had been addressed through him to the House of Delegates and, upon concluding the reading, requested that Dr. Henry H. Turner, the President-Elect, address the House. Dr. Turner spoke briefly and stated that his message to the Association would be given after his induction into office.

At the conclusion of Dr. Turner's remarks, the Speaker called for the reports of the standing and special committees. Since these reports had been published in the April Journal, on the motion of Dr. L. S. Willour, their reading was dispensed with.

Following the acceptance of the committee reports, the Speaker addressed the House on the subject of the next duty of the delegates, which was the adoption of the amendments to the Constitution and By-Laws and which were now ready for final action. The Speaker explained the past work of the Committee appointed to draft the amendments, and their cooperation with the American Medical Association in working out a model Constitution and By-Laws. The Speaker also pointed out necessary rewording changes and explained that the changes were only for the purpose of clarification. All delegates were provided with a letter from the Committee giving the details and reasons for the changes in toto. It also was pointed out that the office of the Executive Secretary had sent copies of these instruments to the county societies for study several months before the meeting. There was no discussion from the floor on the Speaker's remarks and the Speaker then requested that the Committee on the Constitution and By-Laws present the Constitution and By-Laws section by section until they had been voted upon and passed.

The request of the Speaker was complied with, and Dr. E. Albert Aisenstadt proceeded to read the Constitution article by article and section by section. Articles I (Title), II (Purpose of the Association), III (Component Societies), IV (Membership), X (Referendum), and XI (Seal), were passed as read, and Articles V (House of Delegates), VI (The Council), VII (Sessions and Meetings), VIII (General Officers), IX (Finance), XII (Ethics), XIII (Amendments), and XIV (Repealing Article) were passed as amended or reworded for the purpose of clarification. All articles amended had had the proposed amendments offered at the Annual Meeting in 1939 and were thus subject to adoption.

At the conclusion of the adoption of the Constitution, the Speaker requested that the Committee next present the By-Laws for adoption and, in compliance with the Speaker's request, Dr. Ritzhaupt began the reading of the By-Laws chapter by chapter and section by section.

Chapter I (Membership) was adopted upon being read as amended, reworded and clarified in Sections 1 (Eligibility), 2 (Rights), and 3 (Classification), and Section 4 (Good Standing) was completely deleted.

Chapter II (Annual Session) was adopted upon being read as amended, reworded and clarified in Sections 1 (Time and Place), 2 (General Meeting), 3 (Scientific Assembly) and 5 (Section Sessions), and Section 4 (Property of Papers) as originally submitted.

Chapter III (House of Delegates) was adopted upon being read as amended, reworded and clarified in Sections 1 (Representation), 2 (Meetings and Attendance), 4 (Duties of the House of Delegates) and 5 (Order of Business), and Sections 3 (Quorum) and 6 (Memorials and Resolutions) as originally submitted.

During the reading of sub-section (e),—(Finance)—of Section 4, Chapter III, Dr. Ned Smith moved, with a second by Dr. H. K. Speed, that further reading of the By-Laws be dispensed with until the next day, as it obviously could not be completed that night. The Speaker accepted the motion but requested that it be amended to read at the conclusion of Chapter III. The amendment was accepted and the House adjourned at 12:30 a. m. to reconvene the next morning at 8:00 a. m.

### TUESDAY, MAY 7

The House of Delegates reconvened at 8:00 a. m. Tuesday, May 7, in the Crystal Ballroom of the Mayo Hotel, with the Speaker of the House, Dr. J. D. Osborn, presiding. The Credentials Committee reported a quorum present, and the House adopted the Committee's report.

The Speaker at this point introduced Dr. S. E. Russ of San Antonio, Texas, the fraternal delegate from the Texas State Medical Association, and Dr. Russ spoke briefly to the delegates. The Speaker also introduced Dr. Claude Chambers of Seminole, a member of the University Board of Regents, and the first physician in the state to be accorded this honor. A telegram was then read from C. P. Loranz, Secretary-Manager of the Southern Medical Association expressing his disappoint-

ment at not being able to be present, and extending his best wishes for a successful meeting.

Upon the conclusion of the introductions and the reading of communications, the Speaker stated the next order of business would be the continuation of the reading of the By-Laws and their adoption.

Chapter IV (Councilor Districts) was adopted upon being read as amended, reworded and clarified in Sections 1 (Apportionment), and 2 (Terms of Councilors), and Section 3 (Changes of Districts) as originally submitted.

Chapter V (Election of Officers) was adopted upon being read as amended, reworded and clarified in Sections 2 (Nominations) and 5 (Vacancies), and Sections 1 (Ballot), 4 (Installation) and 6 (Nomination of Councilors), as originally submitted. Section 5 was omitted by this action and Section 6 renumbered as Section 5. Section 3 (Time of Election) was tabled.

Dr. Aisenstadt next explained to the House of Delegates that the chapters and sections of the By-Laws from Chapter VI, Section 6, to Chapter IX had been acted upon at the meeting of the House of Delegates in 1939 and would therefore not have to be acted upon at this time, with the exception of changing a few words in Chapter VI, Section 6, and Section 7 for the purpose of clarification. Dr. Aisenstadt moved, and Dr. Bondurant seconded the motion that the word "surplus" in Chapter VI, Section 6, be deleted and the correct terminology, the word "reserve" be inserted. The motion carried.

Chapter IX (Standing Committees) was adopted upon being read as amended, reworded and clarified in Sections 2 (Number of Committee Members), 3 (Committee on Credentials), 6 (Committee on Legislation, Public Policy and Relations), 9 (Committee on Judicial and Professional Relations), and Sections 1 (Standing Committees), 4 (Committee on Annual Session), 5 (Committee on Scientific Work), 7 (Committee on Medical Education and Hospitals), and 8 (Committee on Publicity), as originally submitted.

Chapter X (Dues and Assessments) was adopted as originally submitted, all amendments failing to be adopted.

Chapter XI (Component Societies) was adopted upon being read as amended, reworded, and clarified in Section 3 (Membership), and Sections 1 (County Societies), 2 (Charter), 4 (Custody of Charter), 5 (Constitution and By-Laws), 6 (Function and Duties of Component Societies), 7 (Records), and 8 (Certification of Delegates) as originally submitted.

Chapter XII (Parliamentary Procedure) was adopted as originally submitted.

Chapter XIII (Amendment of By-Laws) was adopted as originally submitted.

Chapter XIV (Repeal of previous By-Laws) was adopted upon being read as amended, reworded and clarified.

This completed the action on the By-Laws and Dr. Aisenstadt moved that the entire set of By-Laws as amended, reworded and clarified be adopted. However, before a vote was taken, Dr. Fulton was recognized by the Speaker, and Dr. Fulton moved, followed by a second by Dr. J. A. Walker, that before action be taken on Dr. Aisenstadt's motion, the delegates reconsider the amendment offered by Dr. Cook to Chapter V, Section 3 (Time of Election). A vote on this motion was sustained and Dr. Cook was recognized to make an amendment to his previous amendment. Both amendments carried and the Speaker next put the motion of Dr. Aisenstadt (which was seconded by Dr. Ritzhaupt) to a vote. The motion carried.

The next order of business was the report of the Resolutions Committee, read by Dr. H. K. Speed, Chairman. The Committee reported favorably on the Third Party Lien Law resolution adopted by the Tulsa County Medical Society and submitted to the House of Delegates for action. The resolution from the Muskogee County Medical Society on medical education was not adopted, and the resolution from the Muskogee County Medical Society favoring the adoption of the quarter system of instruction at the University of Oklahoma School of Medicine was referred to the Committee on Medical Education. The resolution of the Oklahoma County Medical Association regarding the intangible property tax law was reported on unfavorably by the Resolutions Committee and was not adopted. The resolution concerning the practice of clinical pathology introduced by Dr. A. S. Risser was reported on favorably by the Committee and was adopted. (All of these resolutions will be printed in full in the August issue of The Journal.)

The Speaker next recognized Dr. P. M. McNeill, who moved, seconded by Dr. Haynie, that the House next consider the election of officers. The motion carried and the Speaker informed the House that under the new Constitution, a Vice-President would have to be elected, but that at this time the chair would only receive nominations for President-Elect.

Dr. Speed was recognized and placed in nomination the name of Dr. Finis W. Ewing of Muskogee. The Speaker called for other nominations and then recognized Dr. W. S. Larrabee who made the motion, seconded by Dr. J. G. Edwards, that the nominations be closed and all votes cast for Dr. Ewing. The motion carried unanimously and Dr. Ewing was declared elected.

The Speaker next asked for nominations for Vice-President. Dr. T. H. McCarley nominated Dr. W. A. Tolleson and, upon hearing no other nominations, the Speaker recognized Dr. Ned R. Smith who moved, with a second by Dr. O. E. Templin, that the nominations cease and a unanimous ballot be cast for Dr. Tolleson. The motion carried and Dr. Tolleson was declared elected.

Upon completion of the election of a President-Elect and a Vice-President, the Speaker announced that there would be no election for the office of Secretary-Treasurer-Editor, as Dr. Willour's term of office had another year to run. The Speaker then requested that the Vice-Speaker, Dr. P. P. Nesbitt take the chair. Dr. Nesbitt asked for nominations for Speaker of the House of Delegates. Dr. Shade Neely nominated Dr. J. D. Osborn. Upon hearing no other nominations, the Vice-Speaker recognized Dr. Aisenstadt, who moved, with a second by Dr. Risser, that a unanimous ballot be cast for Dr. Osborn. The motion carried and Dr. Osborn was declared elected.

The Speaker next requested nominations for Vice-Speaker of the House of Delegates, and the name of Dr. Nesbitt was offered by Dr. Willour. Dr. H. K. Speed moved, seconded by Dr. McLain Rogers, that Dr. Nesbitt be unanimously elected. The motion carried and Dr. Nesbitt was declared elected.

Upon election of these officers, the Speaker announced there would be a short recess in which the delegates from those districts whose councilors' terms were expiring might elect councilors. He pointed out that Dr. Ewing's place would have to be filled in that district.

After calling the House to order again, the Speaker was informed and so announced that the delegates from district one had reelected Dr. O. E. Templin, and that the delegates from district eight had elected Dr. Shade Neely to fill the unexpired term of Dr. Ewing.

The next order of business was the election of a delegate to the American Medical Association. The names of Dr. W. A. Howard and Dr. W. Albert Cook were placed in nomination. A written ballot was taken and Dr. Howard was declared elected by a vote of 42 to 26.

At this point, Dr. Claude Chambers asked for the privilege of the floor in order to introduce Mr. Lloyd Noble of Ardmore, president of the State Board of Regents, who had flown from Ardmore at the request of Dr. Chambers to appear before the House. The Speaker expressed pleasure in granting the floor to Dr. Chambers for the introduction, and upon being introduced, Mr. Noble expressed his gratitude in being present and made a few pertinent remarks relative to the work of the Board and the advantage of having a member of the medical profession as a member of the Board, since a great deal of their work had to do with

the medical school, University Hospital and the Crippled Children's Hospital. The Speaker thanked Mr. Noble on behalf of the House of Delegates for his remarks and the time he had taken from his business to make the trip.

The Speaker then announced that the chair would entertain motions for the next meeting place of the Association. Dr. George Garrison of Oklahoma City was recognized and extended an invitation to the Association to meet in 1941 in Oklahoma City. The Speaker thanked Dr. Garrison for the invitation, and the House of Delegates unanimously voted to meet in Oklahoma City.

Following this action, Dr. W. A. Howard, the newly elected delegate to the American Medical Association, was accorded the floor and expressed his appreciation and gratitude for the honor accorded him, as well as the cooperation he had received during his term of office as president.

The meeting was adjourned at 11:25 a. m. to meet the next morning at 8 a. m.

WEDNESDAY, MAY 8

The House of Delegates was called to order by the Speaker, Dr. Osborn, at 8:45 a. m. Dr. Willour moved and Dr. C. H. Haralson seconded, that since a quorum obviously was present, the roll call be dispensed with. The motion carried. The Speaker then stated that the Articles of Incorporation of the Association would have to be amended to conform with the new Constitution and By-Laws that had been adopted. After a short discussion, Dr. Risser moved, Dr. Ewing seconded, that the Executive Secretary, with the advice and assistance of legal counsel, be empowered to alter the wording of the Articles of Incorporation to conform to the new Constitution and By-Laws.

The next order of business was the reading of the proposed budget for the coming year. The report was read by Dr. Willour, the Secretary-Treasurer, and upon a motion by Dr. Willour with a second by Dr. Haralson, the budget was adopted as read. Dr. Willour, then stated that Dr. Turner, the new President of the Association, had asked that $2,000.00 be set up in the budget for the continuance of Post-Graduate Teaching for the years 1941-42, and that the request was from the Committee on Post-Graduate Teaching, of which Dr. Turner was chairman. Dr. Willour moved, and Dr. Larrabee seconded, that the request be granted. The motion carried.

The Speaker next recognized Dr. John L. Holland of Madill, who read a paper entitled, "The Relation of the Medical Profession to the Public, and a Look at the Obligated Politician."

At the conclusion of the paper, the Speaker called for the report of the Necrology Committee. The Chairman, Dr. P. H. Anderson, read the report, eulogizing the members of the Association who had passed away during the past year. It was then moved by Dr. Anderson and seconded by Dr. Templin that a copy of this action be sent to the families of the deceased doctors.

The Speaker next read the names of the doctors submitted by the various county societies for honorary membership. (These names appeared in the April issue of The Journal). At the conclusion of the reading of the names, Dr. Willour moved, and Dr. Risser seconded the motion, that these members be elected to honorary membership, subject to scrutiny of their qualifications.

Upon concluding this business, the Speaker informed the delegates that the Resolutions Committee was bringing to the floor another resolution, and since there would of necessity be a litle delay he would recognize Dr. Risser, who desired to introduce Mr. Walter R. McBee, Director of Group Hospital Service, to the House of Delegates. Mr. McBee spoke briefly to the House. His remarks brought out the facts that the State Association had taken the leadership in the formation of Group Hospital Service and that it was the only plan in operation in Oklahoma having the approval of the Medical and Hospital Associations, and that while at the present time operations were being conducted only in Tulsa and Oklahoma City, as soon as possible the rural areas likewise would be serviced. Mr. McBee also invited all those interested to call at the office and all questions concerning the organization would be gladly answered.

At the conclusion of Mr. McBee's remarks, the Speaker informed the House that the Resolutions Committee was ready to report and recognized Dr. Speed, Chairman. Dr. Speed read a resolution to the effect that the Oklahoma State Medical Association was vitally interested in the welfare and progress of the University of Oklahoma School of Medicine, and desired to go on record requesting that future legislatures of the State of Oklahoma make adequate appropriations for the school in order to keep abreast of the progress of medical education, and that a copy of the resolution be sent to the Governor of the State, as well as to the President pro tem of the Senate and the Speaker of the House of Representatives. Dr. Speed moved and Dr. Willour seconded the adoption of the resolution which carried unanimously.

Dr. Speed then requested further indulgence of the House of Delegates and read a second resolution thanking the Tulsa County Medical Society for their splendid handling of the largest state medical meeting ever held in Oklahoma. The resolution carried unanimously.

The Speaker then announced that he would entertain a motion to adjourn. Dr. Willour made the motion, which was seconded by Dr. R. M. Anderson, that the House stand adjourned. The motion carried and the Speaker declared the House adjourned.

## Council Meeting

MAY 6, 1940

The first meeting of the Council of the Association during the 1940 Annual Meeting convened at 3:30 p. m., May 6 in the Mayo Hotel, Tulsa, with President W. A. Howard presiding.

At the request of the Council, Mr. Graham, the Executive Secretary, read the minutes of the last Council meeting, and they were approved as read.

The next order of business was the reading of communications received at the office of the Association requiring Council action. All communications were referred to committees for answering, or the answers directed.

President Howard next requested the reading of the proposed budget for the ensuing year. All entries were discussed by the Council and the budget adopted.

In response to President Howard's request for presentation of any other new business that required the action of the Council, Mr. Graham spoke on the request of Mr. Mott Keys, secretary of the Insurance Fund, for assistance in straightening out the situation relative to the Fund's accounts with the doctors of the state and, after additional remarks by Dr. P. M. McNeill, Dr. J. A. Walker moved that the President appoint a committee of three to confer with Mr. Keys on the matter. The motion carried.

Following this business, the President appointed Dr. McNeill, Dr. James Stevenson and Dr. L. C. Kuyrkendall as a committee to review the audit of the Association's books. He also appointed a committee to study the income tax problem, said committee being Dr. Finis W. Ewing, Dr. V. C. Tisdal and Dr. A. S. Risser. The committees were instructed to report at the next Council meeting.

The President, at this point of the meeting, discussed the advisability of selling the United States Government Bonds of the Association while a premium could be realized, and buying back in Baby Bonds. After a general discussion, it was moved by Dr. O. E. Templin and seconded by Dr. J. A. Walker that the bonds of the Medical Defense Fund be sold and, together with the surplus, be reinvested immediately in Baby Bonds.

Following this discussion, the Council discussed the recommendation of the auditor that the funds of the

Association be moved to Oklahoma City. Dr. Willour pointed out that no doubt the Council would approve the report of the auditor and since this recommendation was in the report, no action was necessary at this time.

The President next requested that the Council approve the bonding of the Executive Secretary and the employees of his office in the amount of $2,500.00, since it was poor business not to have this coverage. Dr. Willour moved and Dr. Risser seconded the motion that this action be approved. The motion carried.

Dr. Risser was next recognized by the Chair and requested as chairman of the Insurance Committee that, since their work was completed and Group Hospital Service was in operation, the committee be dismissed. On the motion of Dr. Ewing, seconded by Dr. O. E. Templin, the committee was discharged with the full appreciation of the Council for its fine work.

The next order of business discussed was the honorary membership of Dr. W. H. Freeman. This matter was referred to Dr. V. C. Tisdal, Councilor of the district in which Dr. Freeman resides, for investigation.

Discussion was taken up on the matter of penalties assessable on membership after February 1. On the motion of Dr. Willour, seconded by Dr. L. C. Kuyrkendall, it was voted to extend the penalty date to April 1. Further discussion was then given to the payment of dues, and the suggestion that members not be allowed to drop out one year and come back in the next without paying up of back dues was made. On the motion of Dr. Willour, seconded by Dr. Kuyrkendall, it was recommended that this suggestion be made in the President's report to the House of Delegates.

There being no other new business at this time, the Council adjourned to reconvene the following morning at the close of the House of Delegates meeting.

MAY 7, 1940

The Council convened in the French Room of the Mayo Hotel in Tulsa at 11:30 a. m., with President Howard presiding.

All members of the Council were present, and President Howard's opening remarks concerned the selling of the Bonds as soon as possible, since the issues had dropped fifty cents since the day before.

The first order of business was the report of the Auditing Committee. The Committee reported favorably on moving the accounts of the Association to Oklahoma City, the employment of a firm of accountants to audit the books each month so long as this service could be had without additional cost, and that the bond covering the Secretary-Treasurer-Editor be included in the blanket bond covering the other employees of the Association. Dr. P. M. McNeill spoke briefly on the report of the committee, and the advisability of retaining an auditing firm. On motion of Dr. J. A. Walker, seconded by Dr. O. E. Templin, the committee report was accepted.

The President then called for the report of the committee studying the income tax case. Dr. Ewing, chairman of the committee, made the committee reports, which recommended that the President execute the necessary documents and transmit them to the proper governmental agency. The committee further recommended that the Articles of Incorporation be amended to conform to the present needs of the Association. Dr. J. A. Walker moved, and Dr. A. S. Risser seconded that the report be accepted. The motion carried.

The Council next approved the bill rendered by Mr. Glenn Davis, the auditor, and voted to expend $100.00 for the printing of the newly adopted Constitution and By-Laws.

The next order of business concerned the salary of the Executive Secretary. Drs. Tisdal, Turner, Willour and Fulton spoke on the advisability of raising the salary, all concurring that a raise was in order. The Council then voted unanimously to raise the salary of the Executive Secretary $25.00 per month, and that this amount be added to the budget.

Discussion was next held as to the bank in Oklahoma City to which the account of the Association was to be transferred. At the conclusion of the discussion, the Council approved the recommendation of the President that the Liberty National Bank be made the depository.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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

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# ASSOCIATION ACTIVITIES

## A. M. A. 1940 Session Sets New Attendance Record

New York City became the medical capital of the world early in June when the first advance guard of physicians began to register at the various hotels for attendance on a number of meetings of special societies which usually are held just before the annual session of the American Medical Association, The Journal of the Association reports. With each day more and more physicians, accompanied frequently by members of their families, poured into the city. By Friday June 14, 12,864 physicians had registered their attendance on the annual session, exceeding by more than 2,500 the largest number ever previously registered in any session. The largest previously was the Atlantic City session at which the Canadian physicians also were in attendance. Physicians filled the lobbies of the hotels, thronged the scientific exhibits, were interviewed by one exhibitor after another in the Technical Exhibits, collected vast amounts of information and samples, applauded the Governor and the Mayor of New York at the opening session, participated in innumerable social events, theater parties and radio broadcasts, and found time for an occasional hour at the World's Fair. Replete with information and entertainment and somewhat exhausted by the drive necessary to get the most out of a meeting of this kind, they began to depart toward the end of the week, expressing universal satisfaction in what they had gained at the meeting.

"The problems that concerned the House of Delegates at this annual session were solved with a perspicacity and unanimity that were in themselves remarkable and yet indicative of the manner in which the medical profession is united today in solving its problems," The Journal said. "Most significant was unquestionably the action taken with regard to medical preparedness. The Committee on Medical Preparedness was formed, including ten members of the House of Delegates and five officials of the Association, and is already in action trying to do all that the medical profession can do to place our country in a position to resist any aggression that may come upon us."

The new officers elected include the President-Elect, Dr. Frank H. Lahey, and a new trustee to succeed the late Dr. Charles Benjamin Wright; namely, Dr. William F. Braasch of Rochester, Minn. San Francisco was chosen as the place of the annual session of 1943.

On four floors of the Grand Central Palace the largest technical and scientific exhibits ever assembled were besieged by great numbers of physicians. Many of the technical exhibitors had prepared new installations of equipment especially for this occasion. A sympathetic gesture was the decision at the end of the session to present surplus supplies to the French War Relief. The Scientific Exhibits subsidized by the American Medical Association served a most useful purpose in graduate education; the individual exhibits surpassed in quality and in interest any similar collection available at any time in this country. Many a visitor to the annual session feels that he gains the utmost in graduate education from these exhibits.

The opening meeting of the annual session was held in the Grand Ballroom of the Waldorf-Astoria. This magnificent hall was packed to the doors and hundreds stood throughout the meeting. The Doctors' Symphony Orchestra, composed of physicians and related professional workers of New York, gave a demonstration of musical competence equal to that of many of the best professional aggregations. The Governor of New York brought the audience to its feet with a stirring appeal for medical cooperation in the maintenance of our democracy and told the assembled physicians that they were the ones to solve the problems of medical care for the American people. The Mayor of New York City, who had flown from Ottawa specifically for this occasion, told of his admiration for medical service and invited the physicians in attendance to visit the medical institutions of New York.

"The general sessions of the Association, the round-table conferences and all the meetings of the various sections were heavily attended, and the discussions were exceptional.

"In the arrangements for the annual session of 1940 the Medical Society of the County of New York and the Medical Society of the State of New York gave complete and valuable cooperation," the editorial stated. "The radio program from this annual session was the largest ever attempted, including numerous broadcasts from local stations as well as on the national chains. The newspapers of New York, overwhelmed by the news of the war, nevertheless gave pages on some days and many columns on others to the news of the annual session. No doubt the success of this great session will stimulate the authorities of New York City, the hotel owners and the Convention Bureau to set in motion the necessary steps to provide that great metropolis with a convention hall adequate to the needs of an annual session of this type. In attendance, in quality and in every other way, it set a mark for scientific meetings."

## Dr. Moorman New President of American Trudeau Society

Recognition of his work in eradication of tuberculosis through local, state and national activities over the past twenty-five years was accorded Dr. L. J. Moorman of Oklahoma City in June when he was inducted as active President of the American Trudeau Society. Dr. Moorman was installed into the office at the annual meeting of the National Tuberculosis Association and the American Trudeau Society, the latter group being the physicians' and tuberculosis specialists' organization, in Cleveland, Ohio.

The American Trudeau Society, following a change in name from the "American Sanatorium Association," now takes in memberships from any physician interested particularly in tuberculosis, thus expanding its usefulness in keeping with more attention to tuberculosis by physicians in private practice.

Among other Oklahomans attending the meeting were Dr. R. M. Shepard of Tulsa, Dr. Richard M. Burke and Dr. Paul B. Lingenfelter of Clinton, and Dr. Carl Puckett of Oklahoma City.

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Dr. R. J. Reichert of Moore, accompanied by Mrs. Reichert and their daughter, Marilyn, spent the month of June in Chicago, where Dr. Reichert took post-graduate work at the Cook County Hospital.

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Dr. M. L. Saddoris of Cleveland, Okla., has been named president of the Cleveland senior chamber of commerce.

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Dr. John H. Walker of Muskogee, with Mrs. Walker, spent a short time in early June in Boston, Mass., and Newport, R. I. While in Boston, Dr. Walker attended a reunion of the class of 1930 at Harvard Medical School.

# Cigarette information worth knowing*

*Philip Morris do not claim to cure irritation but they do say this:*

**62.3%** of the cases of irritation of the nose and throat due to smoking cleared completely on changing to Philip Morris.

**37.7%** the balance, showed definite improvement.

**100% benefited**

*"From tests reported by Laryngoscope, Feb. 1935. Vol. XLV, No. 2, 149-154*

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# *News From The State Health Department*

The science of preventive medicine, as practiced today by public health departments, had its American beginning in March, 1647, when the General Court of Massachusetts Bay Colony provided for a maritime quarantine against ships from the West Indies, where one of the periodic epidemics of yellow fever was raging.

After a period when local governments undertook meager methods of disease control, the movement for state health departments started, in 1869, also in Massachusetts. The central control of state health activities is conceded to be a desirable administrative procedure, with the power over the public health being almost entirely delegated to local authorities.

The next major development in public health is of comparatively recent origin, and is still in process of development. It is the full-time, county health department. The first department of this type is reported to have been organized in Jefferson County, Kentucky, in 1908, and is still in operation. The second county department was in Guilford County, North Carolina, in June, 1911. A month later a similar unit was established in Yakima County, Washington.

Since that time the growth of the county health movement has been steady, due largely to stimulation from the United States Public Health Service, state health departments and other agencies.

In 1921 there were 186 county health departments; in 1926 the number totaled 347 and in 1931 there were 610 such units in 36 states. The figures for 1938 showed 1,000 health departments serving the 2,800 or more counties in the United States.

Systematic organization of county health departments in Oklahoma is a relatively young procedure, the work having started in 1933, with 29 of the state's 77 counties having local health service on a full-time basis in 1939.

Because of its newness to many Oklahomans, the county health department program has been the subject of many erroneous beliefs, which often led to misunderstandings.

A public health department is in reality a cooperative effort among local governmental agencies, the medical and dental professions and interested citizens, to provide better health conditions in the area where it works.

Finances for its operation are provided by the local governing body, and the state health department and the federal government.

Public health is two-sided in its benefits, proving its value to the community from both a financial and a humanitarian viewpoint.

The work of the health department staff is well formulated and definite, with emphasis only on the preventive side of medicine. The personnel might well be likened to instructors in health, advising, helping all groups into ways of healthier living.

Every activity of the health department is directed at close cooperation with the private physician, as the guardian of the citizen's health. The constant advice is "go to your doctor early, and regularly."

Duties of each staff member are well defined. In briefest form, the medical director does the following: formulates policies; performs routine administrative tasks; directs public health education; conducts preschool and school examinations; makes epidemiological investigations; cooperates with civic organizations; has the power of quarantine; conducts venereal disease clinics; directs all activities.

The nurse does the following: teaches control and prevention of communicable disease; encourages venereal disease patients to continue treatment; instructs expectant mothers in maternal hygiene and infant care; interprets results of school examinations to parents; conducts organized classes in home hygiene, first aid, nutrition, prenatal and postnatal care; teaches families to live hygienically; assists the doctor with all physical examinations; assists doctor in immunization clinics; encourages home sanitation.

The sanitarian does the following: assists the doctor in epidemiological investigations; samples public and private water supplies for bacteriological examinations; inspects school water supplies; excreta disposal, lighting, ventilation, lavatory and lunching facilities; consults with plant managers regarding industrial hygiene problems; supervises municipal milk control; supervises dairies not under municipal ordinance; prepares maps, graphs and exhibit materials; inspects swimming pool sanitary facilities.

The clerk does the following: functions as stenographer and typist; collects and tabulates vital statistics; keeps office records; operates filing system; prepares report forms; orders supplies.

Close cooperation is maintained with the medical profession, the health department confining its activities to preventive practice.

However, the health department, through its many clinics, investigations and visits, will find cases needing curative work. In such cases, every effort is made to bring this person under the care of a private physician.

The public health program is a nine point endeavor, covering communicable diseases; venereal diseases; tuberculosis; maternal and infant care; vital statistics; infant and pre-school hygiene; school hygiene; sanitation and food and milk control.

In each field of work it is the goal of the public health worker to find the cases needing attention, get them to take measures for correction, and then to prevent further occurrence by stopping the source.

Public health thus becomes the ally of the physician, finding those who need his attention, educating them to go to the private physician, and removing the source of difficulty.

## "A Good Slogan For a Bad Remedy"

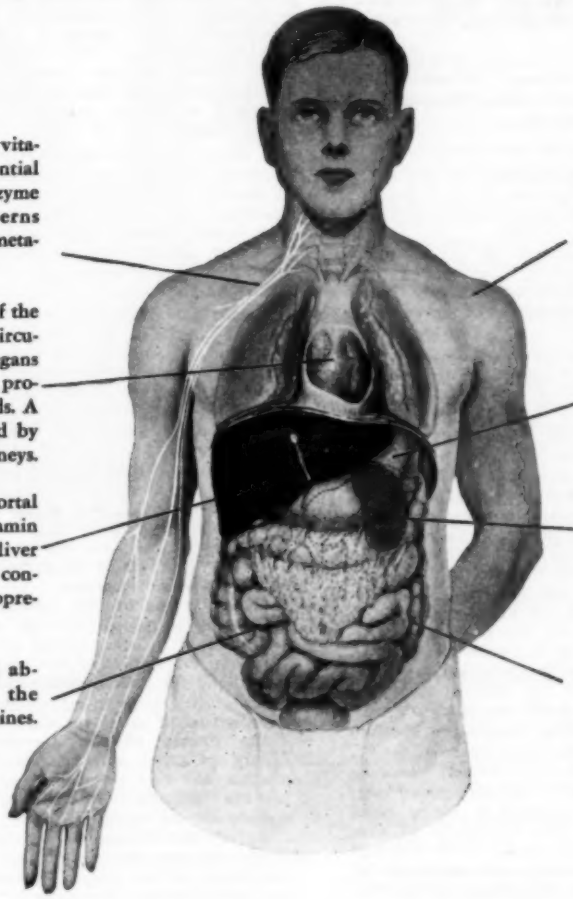
"Advocates of social theories have learned that a slogan is worth a thousand words of argument and many volumes of facts in selling ideas. Thus the phrase 'socialized medicine' is being urged in the attack on the private practice of medicine," *The Journal of the American Medical Association* declares.

"The term is almost perfectly indefinite; it may mean almost anything in the field of medicine that the listener wants it to mean. Defined as properly used in the social sciences, the term can refer only to such medical services as can be helpfully applied to the whole population, are supported by public funds and are properly administered by public authorities. Illustrations would be confined largely to public health and institutional care. This is not, however, what is meant by those who use the slogan. Such services are not, of course, opposed by organized medicine. On the contrary, they have been created and are maintained largely by the organized medical profession.

"The 'goods' which this slogan seeks to sell are really compulsory sickness insurance. This has been found difficult to sell under its original label. Like most quack remedies, it is advertised as a panacea with careful concealment of its actual content and little demonstration of tested results where applied. Many centuries of sad experience with medical panaceas have made physicians suspicious of social ones. Like medical cure-alls, the panacea of compulsory health insurance has failed to produce promised results. Panaceas and slogans are not needed to meet the difficulties in the distribution of the cost of medical care.

# STUDIES IN THE AVITAMINOSES

This page is the seventh of a series on vitamin deficiencies presented by the research division of The Upjohn Company because of the profession's widespread interest in the subject. A full color, two-page insert on the same subject appears in the June 22 issue of The Journal of the American Medical Association.



**(4)** In nerve tissue, vitamin $B_1$ is an essential component of an enzyme system which governs one phase of the metabolic process.

**(3)** The remainder of the vitamin enters the circulation, the various organs removing thiamin in proportion to their needs. A large amount is used by heart, liver, and kidneys.

**(2)** By way of the portal circulation the vitamin is carried to the liver which under normal conditions retains an appreciable amount.

**(1)** Vitamin $B_1$ is absorbed from both the large and small intestines.

**(5)** In skeletal muscle, vitamin $B_1$ also forms a part of an essential enzyme system governing a phase of the oxidative process.

**(6)** The secretory and motor function of the stomach may be affected by involvement of the gastric nervous mechanism as a result of $B_1$ deficiency. This may account for the anorexia in this condition.

**(7)** If excessive quantities of vitamin $B_1$ are ingested and absorbed, they are not stored for future use but are excreted by the kidneys; during periods of diuresis considerable quantities of the vitamin may be lost.

**(8)** Vitamin $B_1$ found in the feces is largely the result of bacterial growth. Coprophagy provides a source of $B_1$ for some species of animals.

## The Metabolic Fate of Vitamin $B_1$

In the tissues, vitamin $B_1$ is an essential part of an enzyme system governing one phase of cellular metabolism. Vitamin $B_1$ appears to be converted to co-carboxylase, which is essential for the oxidation of pyruvic acid, one of the intermediary products of carbohydrate metabolism.

UPJOHN

## *Southern State Medical Group Meets in Chickasha*

Explanation of the use of sulfanilamide and its derivatives in the treatment of pneumonia and related cases by Dr. Walter Reddica, Dallas internist and staff member of the Baylor University Medical School, highlighted the meeting of the Southern Oklahoma Medical Association at Chickasha in June. An interesting paper was read by Dr. A. I. Folsom of Dallas, urologist and also a member of the medical school staff.

During a dinner in the evening at the Chickasha Country Club, doctors and their wives were entertained by dancing school pupils.

The meeting opened at 2 p. m. in the afternoon of June 6, continuing into the evening. Wives of the visiting doctors were entertained by the ladies auxiliary of the Grady County Medical Society.

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### Opportunities For Practice

The Journal has been advised of a number of openings for practice, which are as follows:

Mr. W. R. Fulton, Superintendent of the Hammon Public School, Hammon, Oklahoma, has advised that there is an opening for a young physician to enter practice in that town (population, 800) and surrounding farm territory.

An opportunity for practice exists in Roosevelt, Oklahoma. Anyone interested should communicate with Mr. John B. Dover, Rexall Drug Store, Roosevelt, Okla.

Dr. Mark F. Boyd, Director, Station for Malaria Research at Tallahassee, Florida, operated under the Rockefeller Foundation of New York, is anxious to obtain the services of a young physician. The successful applicant would live at the Florida State Hospital at Chattahoochee, where living quarters are provided. The salary is $2,000 per year, plus quarters. An allowance of $30 per month also is given for the maintenance and operation of an automobile required in the daily trips between the hospital and the laboratory. A satisfactory performance of duty would lead to annual increases at the rate of ten per cent. Dr. Boyd also states that the State Board of Medical Examiners of Florida has waived the requirements that the physician appointed should take the examination of the Medical Board of Licensure. Anyone interested should communicate with Dr. Mark F. Boyd, P. O. Box 997, Tallahassee, Florida.

Notice of an opening has been received from Dr. V. G. Logan, county physician and health officer, American Falls, Idaho. The notice stated: "Wanted, young married man. Protestant, as an assistant in Idaho, small town. Salary, $175 to start. Must be able to do some surgery, appendectomy and tonsillectomy. Have excellent small hospital, all graduate nurses. Character one of first considerations, as well as personality. Practically all work (95%) is done in the office or hospital. Send photograph."

An opportunity for practice exists for a young physician in Seiling, Oklahoma, population 850. Anyone interested should contact Mr. H. S. Bivens of that town.

## *Services of A. M. A. Constantly Increasing, Reports Show*

The constantly increasing service of the American Medical Association to the public and to medicine is revealed in the reports of officers of the Association, published in the May 11 issue of The Journal of the Association. The organization's by-laws provide that such reports must be published one month in advance of the annual meeting, which this year was held in New York June 10-14.

Evidence of the solidarity of the medical profession is contained in the membership figures. The secretary reports that as of March 1, 1940, there were 115,381 members, a gain of 3,171 over the total of the previous year. During the past three years, a period in which the Association has been the object of extensive attacks, including a federal indictment, the membership has shown a total gain of 9,921.

A total of seventy-one grants in aid of research were made in 1939 by the Association. Thirty-seven, made by the Committee on Scientific Research, included investigations into the chemical changes in heart muscle, high blood pressure, tuberculosis, brain injuries, food poisoning, gastric and duodenal ulcers, bone marrow, vitamin C requirements of man, sex hormones and studies of the blood.

Twenty-nine grants, made by the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry, included assistance in research on whooping cough, local anesthetics, sulfapyridine and malaria. The Committee on Research of the Council on Physical Therapy made five grants, which gave assistance for experimental work in such fields as the effect of heat in bone and joint repair.

The net cost of publication of seven special journals published by the Association, of Hygeia, The Health Magazine and of the Quarterly Cumulative Index Medicus, which is an index of the best medical literature of the world, exceeded income received by the sum of $75,947. The index is recognized as a distinct contribution to scientific medicine.

The activities of the Association in promoting the health of the people through sound health education are reflected to some extent in the report on Hygeia. The total circulation of the magazine was in excess of 110,000, a net paid increase of 7,588 over that of the year before. Gains in circulation also are reported for The Journal of the Association and the special journals.

The library of the Association distributed 2,993 library packages and lent 12,714 periodicals. Bibliographic aid was given in response to 6,000 requests and the facilities of the library were utilized by 1,545 visitors during the year.

Among the important activities of the Council on Pharmacy and Chemistry were investigations in its laboratory of the properties and uses of sulfanilamide and sulfapyridine, standards for the latter being established during the year. The report points out that under the new federal Food, Drug and Cosmetic Act, "the proper agencies of the federal government will no doubt deal effectively with mislabeled products but it is not within the purview of such agencies to determine whether or not a drug is a worth while addition to

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[1] Cooke, R. A., and Stull, A.: *J. Allergy* 4:87, 1933 and previous papers.

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materia medica and it is therefore highly important that the profession give whole-hearted support to the work of the Council." The report again emphasizes that members of the Council serve without any remuneration. No fee or payments of any sort is required or accepted from anyone who submits products for official consideration by the Council.

During the year the Council on Foods continued to increase its service to the public and the profession in the field of foods and nutrition. Among its principal activities were investigations and reports on the need for the addition of vitamin B1 to staple foods, the loss of vitamin C in orange juice on standing, vitamin mixtures, claims for food products rich in certain vitamins, lead in foods, the flourine content of foods and the fortification of foods with vitamins and minerals.

Investigations in the fields of audiometers and hearing aids, inhalators and resuscitators, "fever treatment" apparatuses and radio interference said to be caused by electromedical equipment, were among the activities of the Council on Physical Therapy.

An educational campaign is being conducted by the Council on Industrial Health, features of which include the Annual Congress on Industrial Health sponsored by the Council.

The increasing effectiveness of the Association's work in furthering the high standards of medical education for students as well as postgraduate education for the practicing physician, is reflected in the report of the Council on Medical Education and Hospitals.

Another index to the service of the Association to the general public as well as to the profession is contained in the report of the Bureau of Health Education. During the year the Bureau handled 19,660 pieces of mail, in the course of which it answered more than 10,000 letters from laymen. It also received a large volume of mail from listeners to the Association's radio program, "Medicine in the News," broadcast by the National Broadcasting Company for thirty weeks during the winter months under the direction of the Bureau.

Studies and reports on arrangements for the distribution of medical care and on group hospitalization plans were among the activities of the Bureau of Medical Economics. It reports that at present at least fourteen state medical societies have statewide arrangements for medical care in various stages of development or operation and that at the close of 1939 there were 108 group hospitalization organizations in operation in thirty-five states and in the District of Columbia.

The Bureau of Investigation continued to increase the amount of information furnished on "patent medicines," charlatans and frauds to physicians, laymen, government agencies, better business bureaus, business corporations, newspapers, radio stations and other groups.

In addition to the scientific exhibits at the annual session of the Association, the Bureau of Exhibits reports that in 1939, 200 exhibits were shown in various cities in the United States and Canada in addition to those being maintained at the New York World's Fair and the Golden Gate International Exposition. Its other activities include motion pictures for the use of medical and other scientific groups.

Other of the other regular activities of the Association are described in the reports of the Council on Scientific Assembly, the body which arranges the scientific programs for the annual sessions of the Association, and the Bureau of Legal Medicine and Legislation.

Some of the special activities involve the Committee on Air Conditioning, the Committee to Study Problems of Motor Vehicle Accidents, and the Advisory Committee on Advertising of Cosmetics and Soaps. Evidence of the effectiveness of the work of the latter, its report says, is that those concerns whose products had previously been passed on by the committee found little difficulty in meeting the new federal regulations on cosmetics.

## *Syphilis Treatment Data Asked By Social Hygiene Society*

Asked By Social Hygiene Society.

In order that there may be a central source of information with regard to studies of the intravenous drip method of treatment of syphilis ("the five day treatment"), the American Social Hygiene Association at 50 West 50th Street, New York, has been asked to gather and to keep available information regarding this subject. The Association requests all physicians and hospitals which are planning or are now carrying on studies of experiments with this method of treatment of syphilis to send brief information regarding the following points to the Association at the above address:

1. Name of hospital or other institution.
2. Name of principal physician in charge of the intravenous drip study.
3. Type of case or cases of syphilis treated by the intravenous drip method.
4. Name of drug or drugs used.
   (a) By the intravenous drip method.
   (b) By any other method before, during or after intravenous drip therapy. (Mention any specific therapy used.)
5. Routine laboratory work done on cases of syphilis treated by the intravenous drip method.
6. Usual number of hours of intravenous drip treatment per day per patient.
7. Usual number of days of intravenous drip treatment per patient.
8. Any other pertinent facts.

The Association will be glad, so far as possible, to answer inquiries regarding the intravenous drip treatment of syphilis. The Association has available to physicians, upon request, a brief pamphlet on the subject of the present status of the intravenous drip method of treatment of syphilis, written by Dr. Charles Walter Clarke, Executive Director of the Association and a member of the New York City Committee on the Intravenous Drip Treatment of Syphilis.

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### Typhoid Deaths in Large Cities Drop

Typhoid deaths in the ninety-three largest cities of the United States dropped from 291 in 1938 to 265 in 1939, thus continuing the consistent downward trend in the mortality rate from this disease during recent years, The Journal of the American Medical Association declares in its twenty-eighth annual report of typhoid deaths.

The 1939 rate per hundred thousand of population was 0.67 as compared with 0.74 in 1938. Thirty-four cities reported no death from typhoid, an increase of five over the previous year.

Recent typhoid death rates represented a tremendous improvement over those of the early part of the century. In 1910 the rate for seventy-eight of the ninety-three cities included in the present report was 20.54 and in 1915 it was 9.47. However, by 1920 it had dropped to 3.85, and the rate at five year intervals thereafter were 3.44, 1.61 and 0.98, respectively. The rate for these same seventy-eight cities in 1939 was 0.65.

Figures for the report were obtained from local health officers, who were asked to furnish an estimate of the population and to give the number of deaths from typhoid among both residents and nonresidents. Paratyphoid A, which is closely related to typhoid, was not included in this study.

Bridgeport, Conn., now heads the honor list with no death in six years. Fort Wayne, Ind., has had none in five years; South Bend, Ind., and Utica, N. Y., none in four years, and Fall River and Lynn, Mass., Milwaukee, Wis., New Bedford, Conn., and Wichita, Kan., none in three years. Others with no deaths in 1938 or 1939 were Cambridge, Mass., Elizabeth, N. J., Lowell, Mass., Kansas City, Kan., and Salt Lake City.

New York and Chicago, with 0.3 deaths per hundred thousand population, had the lowest rates among the nation's eight largest cities. Los Angeles had a rate of 0.4, Detroit 0.5, Cleveland 0.5, Philadelphia 0.6, St. Louis 0.7 and Baltimore 0.7. However, the last four cities reported that one-third or more of the deaths within their limits were of nonresidents. Since many large cities furnish hospital facilities for the surrounding rural communities, the hospitalization of non-residents is responsible in many instances for raising appreciably the number of deaths attributed to these cities.

Cities of the New England states had the lowest rate, 0.23, representing six deaths as compared to twelve in 1938. Other groups of cities rank as follows: Middle Atlantic cities (in New York, New Jersey and Pennsylvania) 0.37, East North Central cities (Illinois, Indiana, Wisconsin, Ohio and Michigan) 0.44, West North Central cities (Kansas, Missouri, Nebraska, Minnesota and Iowa) 0.50, Mountain and Pacific cities (Washington, California, Oregon and Colorado) 0.51, South Atlantic cities (Delaware, Maryland, Virginia, Florida and Georgia and Washington, D. C.) 1.03, East South Central cities (Alabama, Kentucky and Tennessee) 2.42, and West South Central cities (Texas, Oklahoma and Louisiana) 3.19.

### Smallpox Vaccine Used For Fever Blisters

The successful treatment with smallpox vaccine of fourteen patients troubled for years with recurrent fever blisters of the eye, nose, lips and face is reported by Perk Lee Davis, M.D., Philadelphia, in The Journal of the American Medical Association.

Dr. Davis points out that a relation between immunity to fever blisters and the virus diseases, smallpox and chickenpox, was suggested in 1927. "In man," he explains, "there are many infectious fevers caused by virus agents. Although recovery from many virus diseases gives an immunity which lasts for years, it is not constant. It is well known that the common cold, fever blisters and influenza do not protect the individual from subsequent attacks."

The author says that smallpox vaccine for recurring infections characterized by fever blisters seems to work best if used every ten to fourteen days from four to eight times.

### The Medical Profession and the F. T. C.

"For many years the columns of the American Medical Association have been thundering away at quackery and nostrums that prey on the lives and financial resources of credulous millions," K. E. Miller, M.D., Washington, D. C., director of the Medical Advisory Division of the Federal Trade Commission, declares in an article in The Journal of the American Medical Association for June 1, wherein he discusses the community of interest between the Commission and the medical profession.

"A splendid contribution has thus been made," he continues, "but the full fruition of these efforts rests with regulatory measures whereby compliance with certain standards can be enforced."

Dr. Miller points out that it may not be so generally known that the Federal Trade Commission is charged with the duty of confining advertisers of food, drugs, cosmetics and health devices to fair and truthful representations.

He says that although it is concerned with the claims made by manufacturers and distributors of drugs to the profession, the great bulk of the Commission's problems with respect to drugs has to do with preparations sold to the lay public for self treatment.

Discussing ways in which the profession can aid the Commission in safeguarding the public, as far as possible, against physical disasters born of false and misleading claims, Dr. Miller says:

"The parallel activities of the medical profession and the FTC, therefore, may be properly regarded in the light of mutual assistance. Medical testimony, either actual or potential, is the very backbone of every single case in this category. When falsehood and innuendo in this class of advertising becomes too distasteful to the physician he may take consolation in the thought that there is a way out of this wilderness, but he must at the same time realize that he or his kind will not only have to assist in blazing the trail but also lend a hand to the spade work."

### Awards Set For Observations On Epilepsy

The recently organized Laymen's League Against Epilepsy announces two annual awards of $100 each for the best original unpublished observations bearing on the subject of epilepsy. One award will be made for work done in a state epileptic colony or mental hospital; the other for work done elsewhere. Clinical as well as laboratory studies will be welcomed, the announcement states. Since one object of the award is to encourage junior workers, the committee will take into consideration the facilities of the authors. The committee will consist of the president of the American League Against Epilepsy, the chairman of the section on convlusive disorders of the American Psychiatric Association, and a third physician chosen by the officers of the Layman's League. It is hoped that winning contributions will be presented before the annual joint scientific session of the first two of these organizations.

Contributions should be submitted by next December 15. Further information can be obtained from the secretary of the Layman's League, Mrs. N. Bond Fleming, 25 Shattuck Street, Boston.

### Orthopaedic Group Elects Officers

Dr. George E. Bennett, Baltimore, was chosen president-elect of the American Orthopaedic Association at its recent session in Kansas City, and Dr. David E. Robertson of Toronto was installed as president.

Other officers include Drs. Norman T. Kirk of San Francisco, vice-president; Charles W. Peabody of Detroit, secretary; and Rexford L. Diveley of Kansas City, Mo., treasurer. Toronto was tentatively selected as the 1941 convention city.

## *Red Cross Issues Nationwide Appeal for Relief Funds*

The American Red Cross has issued a nationwide appeal for funds for a minimum war relief fund of $10,000,000 to continue and expand essential activities on behalf of civilian victims of the hostilities in Europe. According to an announcement, the Red Cross had, May 6, spent close to $1,500,000, most of it from reserve funds. More than $300,000 additional had been spent by chapters in purchasing materials for production of relief supplies.

Up to May 6 the 250,000 volunteer Red Cross workers had given more than 3,000,000 hours of their time since last September in the production of 447,000 warm garments and 2,261,000 surgical dressings. These supplies, along with tons of drugs and medicines, surgical instruments, x-ray equipment, ambulances, hospital tents, soap and other material have been shipped periodically to the Red Cross societies of war-affected countries. Aid is now being provided to Belgium, Luxembourg, the Netherlands, Finland, France, Norway, England, German-occupied Poland, Latvia, Lithuania, Rumania, Hungary and Yugoslavia. The announcement stated that the Red Cross societies of all countries involved in armed conflict in Europe have requested aid except Germany.

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Dr. William A. Tolleson of Eufaula, Vice-President of the Association, was one of the members of the Missouri Medical College's graduating class of 1895 attending a reunion of the class in Murphysboro, Ill., in early June.

### Gallbladder Disease in Children Not Rare

Since 450 cases of gallbladder disease in children less than 15 years of age are now on record, disorders of the biliary tract in children can no longer be regarded as rare; thus many of the vague "stomach aches" of children may readily be manifestations of this disease, Victor Seidler, M.D., and Elizabeth Brakeley, M. D., Montclair, N. J., state in The Journal of the American Medical Association.

The two authors point out that: "The diagnosis of biliary tract disease during the early years of life may be reached by the same methods (x-rays) now employed for adults and is in no way more complicated or difficult than with adults. Because the symptoms so closely simulate those of appendicitis, differential diagnosis is often misused. Therefore the pediatrician (specialist in children's diseases) and the surgeon should be on the alert to recognize gallbladder disease unerringly and to operate promptly when surgical treatment is indicated."

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Dr. George S. Mechling of Oklahoma City was the guest speaker at the June meeting of the Osage County Medical Society in Pawhuska. Dr. Mechling gave an illustrated lecture on "Suggestions in Anaesthesia for the General Practitioner."

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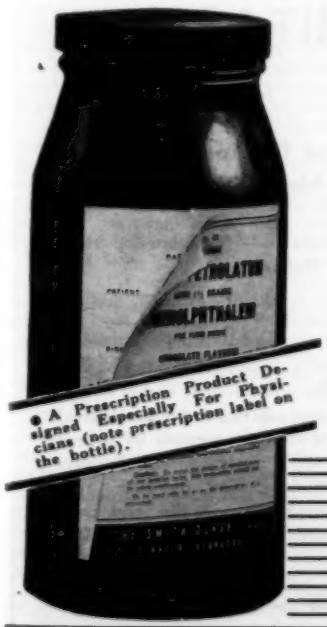
Dr. George L. Kaiser has been appointed physician in charge of venereal disease clinics for the Muskogee city-county health unit, Dr. J. T. McInnis, director, has announced. Dr. Kaiser succeeds Dr. Robert E. Pugh, who has moved to Checotah.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## *Tuberculosis Survey Reveals 202,021 Treated During 1938*

A survey of tuberculosis facilities in the United States in 1938, conducted by the Council on Medical Education and Hospitals of the American Medical Association and reported in the latter's *Journal* for March 2, shows that, according to returns representing 99 per cent of the total bed capacity of all registered hospitals, during that year 202,021 persons in this country were treated for tuberculosis.

Supplementing one made by the Council in 1933-35, the survey also shows that in 1938 there were 122,342 patients admitted to those sanatoriums, tuberculosis departments of general hospitals and preventoriums which made reports. The average daily census was 79,300. Commenting on this, *The Journal* says:

"This represents an annual expenditure of over seventy million dollars for hospital care, not including the loss of earning power of the patients or the care of dependents. Tuberculosis is therefore still a great economic problem. The survey reveals also an increasing use of sanatorium facilities for far advanced cases, a trend which will aid in decreasing dangerous foci of infection. However, the continued hospitalization of nontuberculous children in some of the sanatoriums for adult tuberculosis is fraught with danger if separate units are not maintained. When additional beds are required for the care of patients it would seem logical to convert preventorium units to sanatorium use, for the isolation of open cases has proved more effective in the prevention of tuberculosis than the hospitalization of tuberculosis contacts. There are 98,801 beds available in this country for tuberculosis patients, including 4,830 assigned to preventorium care. While additional beds are needed in various communities, the evaluation of sanatorium needs can better be ascribed to members of the medical profession and other agencies familiar with local conditions. Institutional care is a vital factor in the prevention and treatment of tuberculosis. From an epidemiologic point of view, segregation and treatment accomplish the same result in removing foci of infection from the community, and that is the essence of tuberculosis control."

The survey shows that the waiting list for admission to sanatoriums and tuberculosis departments in 1938 totaled 8,797 as compared with 9,854 in 1935. Discussing this, the survey says:

"It is apparent that the present waiting list is largely the result of unequal distribution, since the number of vacant beds, 16,254 in all, exceeds the number of applications now pending by 7,457."

In state and city-county sanatoriums the waiting list was considerably greater than the number of vacancies, whereas in other sanatoriums the situation was reversed. Vacant beds in the tuberculosis departments totaled 6,677 or 5,452 more than the number of patients applying for admission. However, the municipal departments had a waiting list of nearly twice the number of vacancies.

Other facts revealed by the survey, based on information from 5,950 hospitals, include the following:

The total number of beds for tuberculous patients was 98,801, of which 87,084 were for adults and 11,717 for children. Included in the beds for children were 4,830 for preventorium care. The number of children admitted was 13,400, whereas the previous survey reported 15,523.

The average length of stay in the tuberculosis sanatoriums was 164 days as compared to 166 in 1934. In tuberculosis departments the average of 101 days was the same as in 1935. Discussing this, the survey says:

"The average length of stay in the sanatorium group is apparently decreasing as a result of continuing improvements in the medical and surgical treatment of tuberculosis. It may eventually increase, however, when the sanatoriums begin to realize their full responsibility in the rehabilitation of patients. Then the period of hospitalization will no doubt be extended to include suitable programs of graduated exercise and courses of vocational traning now lacking in most of the institutions. A well balanced sanatorium service is one that gives due consideration not only to prevention and treatment but also to rehabilitative measures that may prevent a further reactivation of the disease."

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### Infant Mortality Rate At Low Point

The Bureau of the Census recently issued statistics on the infant mortality rates for 1938, with comparisons of rates in previous years. The general rate for continental United States in 1938 was 51, the lowest since the birth registration area was established in 1915 and undoubtedly the lowest in the history of the country, the bureau states. In 1916 and 1918 the rate was above 100 deaths per thousand live births.

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# ABSTRACTS : REVIEWS : COMMENTS and CORRESPONDENCE

## SURGERY AND GYNECOLOGY

Abstracts, Reviews and Comments From
LeRoy Long Clinic
714 Medical Arts Building, Oklahoma City

**"Penetrating Wounds of the Abdomen." By Ambrose H. Storck, M.D., Annals of Surgery, May 1940, Page 775, Volume 111.**

This comprehensive article, delivered before the meeting of the Southern Surgical Association in December, 1939, deals with the author's personal experience in handling 46 such injuries.

In my judgment it is an excellent article. It seems here worth while to list the following conclusions of the author:

(1) Facilities for quick transportation, arrangements to shorten the preoperative duration of the injuries, and provisions for promptly combating shock and hemorrhage are important in the management of penetrating wounds of the abdomen.

(2) The symptoms associated with penetrating wounds of the abdomen are frequently indefinite. Pain is frequently slight or absent. Penetrating wounds of the abdomen which occur via the gluteal, sacral, or perineal regions are particularly likely to be overlooked because of the frequent absence of early symptoms.

(3) Physical findings in penetrating wounds of the abdomen may be misleading. Tenderness and rigidity are not constantly present.

(4) Examination of the urine for gross or microscopic blood should be made in order to reveal or confirm the presence of injuries of the urinary tract.

(5) Red blood cell counts and hemoglobin determinations may be misleading or late indicators of hemorrhage.

(6) Roentgenologic examination is often of value in the preoperative determination of probable injuries.

(7) The recognition of associated injuries, particularly those of the chest, is important in the management of penetrating wounds of the abdomen.

(8) Study of wounds of entrance and exit may indicate whether or not penetration of the abdomen has occurred. When there is uncertainty concerning penetration of the abdomen, exploratory celiotomy usually should be performed. Even when the wounds have been produced by small-sized shot, abdominal exploration should be performed.

(9) A short interval between the time of injury and the time of operation usually favorably influences the outcome, but operations should be delayed until patients have at least considerably recovered from shock. In upper abdominal penetrating wounds, operation may be necessary and is relatively safe during a longer period than in wounds which involve the lower portions of the abdomen.

(10) Prolonged shock produces irreversible deleterious effects; therefore, attempts should be made to rapidly combat shock and hemorrhage.

(11) The extent of hemorrhage largely determines the outcome in penetrating wounds of the abdomen. In the presence of considerable hemorrhage, transfusions during and shortly after operation and totaling as much as 3,000 cc. of blood may be necessary. Transfusion registries and blood banks are important in making available adequate supplies of blood. Transfusions of blood should, whenever possible, displace the administration of saline or glucose infusions or stimulant drugs.

(12) Spinal anesthesia may be employed to advantage in selected cases.

(13) The ricochet of bullets, as well as variations in the relative position of parts of the patient's body at the time of injury, as compared with the position of the same parts on the operating table, accounts for apparently bizarre courses of bullets. Unexpected and unpredictable visceral injuries due to the position of the patient, or the phase of respiration at the time of injury, were frequently observed.

(14) The total number of perforations of either hollow or solid viscera was only slightly less in the group which lived than in the group which died.

(15) Whenever perforation of one wall of a hollow viscus is detected the opposite wall of the viscus should be examined for possible injury.

(16) The mortality rate was unusually low in the group of cases with large intestine injury, probably because of the relatively small amount of spillage which accompanies such injuries.

(17) Extraperitoneal hemorrhage or hemorrhage between the leaves of the mesentery is likely to obscure important injuries.

(18) Injuries of the gallbladder, bile ducts, pancreas and kidneys are extremely serious. Perforations of the spleen usually require splenectomy. Hemorrhage from lacerations of the liver may sometimes be satisfactorily sutured, but in other instances hemorrhage from lacerated surfaces of the liver can best be controlled by means of packs.

(19) Unrepaired performations are frequently discovered at autopsy; therefore, reexamination after all perforations are thought to have been repaired is advisable if the patient's condition warrants such a procedure.

(20) Because of the important relationship between hemorrhage and mortality, attention during operation should be directed first to the arrest of bleeding.

(21) Time-consuming procedures, such as intestinal resection, should be avoided whenever possible.

(22) Mechanical anastomosis devices should rarely if ever be used.

(23) Enterostomy is usually ineffectual, and has been displaced by better methods of preventing or combating ileus.

(24) Drains introduced into the peritoneal cavity are usually unnecessary and undesirable, but drainage of the abdominal wall should be instituted when hollow viscera have been perforated.

(25) Silk or cotton sutures and ligatures are superior to catgut for the repair of hollow viscera and for the closure of the abdominal wall.

(26) Irrigation or lavage of the peritoneal cavity is usually futile, but it is desirable to suck out or pick out from the peritoneal cavity liquid blood, blood clots, detached particles of viscera, intestinal contents, and foreign bodies.

(27) Postoperative attention should include measures to combat any still existing shock or effects of hemorrhage.

(28) The application of heat to the abdomen, the administration of large doses of morphine, the establishment of gastroduodenal suction drainage, the avoidance of enemata and flushes, and the infusion of glucose and lactated Ringer's solution are effective measures in preventing or reducing the severity of ileus and peritonitis. The Miller-Abbott tube as well as oxygen therapy may be employed to advantage in selected cases.

(29) Biologic preparations, such as coli-bactragen, and chemotherapeutic agents such as sulfanilamide and sulfapyridine may prove of value in reducing the mortality from peritonitis resulting from penetrating wounds of the abdomen. Desoxycorticosterone acetate, or other preparations containing the adrenal cortex hormone, may benefit those cases in which peritonitis is anticipated or already exists.

(30) Vitamins should be administered parenterally or orally to favor wound healing and to compensate for the general vitamin deficiency which is likely to develop during the post-operative period.

(31) Lyophiled serum or whole blood transfusions are sometimes necessary to maintain plasma protein at a normal level during the postoperative period.

(32) Atelectasis and pneumonia frequently complicate penetrating wounds of the abdomen; therefore, measures should be taken to prevent or promptly treat these pulmonary complications.

(33) The mortality of penetrating wounds of the abdomen is, and will surely continue to be, disappointingly high. In the present series, the mortality in the stab wound cases was 27.2 per cent; the mortality in the gunshot wound cases was 40 per cent; and the combined mortality was 37 per cent. However, recent advances in the treatment of shock, hemorrhage, ileus and peritonitis, all of which are so important in the management of penetrating wounds of the abdomen, are encouraging.

LeRoy D. Long.

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**"Management of Advanced Appendicitis in Childhood." By W. D. Gath, M.D., R. E. Grey, M.D., and Felix Ballenger, M.D.; The Journal of the American Medical Association. May 11, 1940—Volume 114, No. 19, Page 19.**

The authors report their results in the treatment of 656 consecutive cases of appendicitis in children under 16, during the past 7 years. The cases are divided into 3 groups:

(A) Cases without gangrene or suppuration, 357 with no deaths.

(B) Cases with gangrene or suppuration but without perforation or with early perforation, 164 with no deaths.

(C) Cases with gangrene and perforation or with perforation and abcess, 135 with 4 deaths, or a mortality of 2.9 per cent. The mortality rate for the entire series was 0.6 per cent. The remainder of the article deals with the 135 cases of group C.

Immediate operation was performed on 119 patients and delayed operation on the remaining 16. There was 1 death in the former group, a mortality of 0.83 per cent. This child died on the 94th postoperative day with general septicimia and ulcerative endocarditis.

Of the 16 advanced cases which were treated without immediate operation, 3 died, a mortality of 18.7 per cent. The patients in the delayed group who recovered were in no worse condition on admission than was the average patient in the group operated on immediately. They had more complications and a longer hospital stay. There is no reason to believe that they would not have recovered if they had been operated on immediately. Could the 3 deaths have been prevented by operation? This, of course, cannot be answered, but it is certain that the results of operation would not have been worse than those of conservative treatment. There is the strong possibility that it might have stopped a fatal spread of peritonitis.

All of the operations were done by surgeons with considerable experience in operating for advanced appendicitis. Their technique is as follows: McBurney's Incision. Adequate exposure of the operative field. Gauze used sparingly and only to facilitate exposure. Location of appendix and evacuation of abscess by suction and gentle sponging. Removal of the appendix, if possible. (It was removed in all but seven of the 119 cases.) Ligation of the appendix stump and invagination with a suture of fine catgut, unless the cecum is too friable to permit suturing. Exploration of the pelvis and the lumbar gutter for pus or contaminated fluid. Insertion as indicated of Penrose tubes without gauze, into pelvis and lumbar gutter or as a coffer dam around the head of the cecum. Interposition, if possible, or the great omentum between the drains and the intestine. Loose closure of the wound in the abdominal wall.

The authors are convinced that a successful outcome in these advanced cases demands the use of abundant drainage. It is not necessary to drain a merely contaminated area of peritoneum, but an infected area, especially one enclosing an abscess, must be thoroughly drained and the drains be left in place 7 to 9 days—until a good sinus is established.

All patients had continuous gastric suction started immediately after operation, and continued until regurgitation of bowel contents had ceased. Codeine and morphine were practically the only drugs used. Control of body fluids was probably the most important part of the postoperative treatment. The authors' views are quoted:

"Peritonitis must be the ultimate cause of the changes in the quantity, composition, and movements of the body fluids observed in patients with appendicitis. We once thought that these changes were due chiefly to a loss of water and electrolytes by vomiting. We now believe that peritonitis causes other and much more dangerous effects on the body fluids by robbing the blood of its proteins. It is well known that, when damaged by inflammation, the capillary endothelium permits the escape of these substances from the blood stream. It is conceivable that in extensive peritonitis the blood may lose enough protein to deprive it of the osmotic pressure necessary to absorb water from the tissues. In this event concentration of the blood and edema of the tissues would occur.

"Observation of the beneficial effects of blood transfusion on children with peritonitis led us to adopt the conception just stated. Our use of blood transfusion was purely empirical for a long time. We did not understand their real action till we began to study the effects of cutaneous burns on blood. Then we chanced to observe in two patients with generalized peritonitis due to perforation of the colon by cancer the identical blood picture caused by burns, namely hemoconcentration and a great decrease in blood proteins. It can readily be produced by aseptic peritonitis in the experimental animal. The clinical symptoms of extreme blood concentration are startling cyanosis, euphoria, tachycardia, low blood pressure, generalized edema and bubbling rales throughout the lungs. Onset of the trouble is disclosed by strict edema and a little cyanosis. The peritoneum has about the same area as the skin. Just as a total cutaneous burn is always fatal, so is a general peritonitis, and from the same cause and with the same symptoms. We do not deny that peritonitis causes a true toxemia, but we have come to regard this as a secondary cause of the symptoms. It is always well to remember that inflammation favors exudation and not absorption.

"It follows from the foregoing that the injudicious administration of water to a patient with widespread peritonitis is dangerous. It dilutes the blood proteins and washes them out of the damaged capillaries of the inflamed peritoneum.

"The bad effects or even mild degrees of hypoproteinemia are well known. It deranges the metabolism of the entire body by preventing orderly exchange of materials between the blood and the tissue cells. It favors the spread of peritonitis because it devitalizes the tissues.

"We are convinced that without the free use of blood transfusions many of the desperately ill children in this series would have died, and we strongly advise that in every case of peritonitis the blood proteins be kept above the critical level at which edema develops."

The authors do not feel that appendicitis is more dangerous in childhood than in adult life. Since the diag-

nosis is more difficult in children it is probable that the disease is usually more advanced at the time of operation. Given a healthy child and a healthy adult both with appendicitis in the same stage and with identical treatment, they believe that the outlook for the child is about the same as for the adult.

Our purpose in abstracting this article is to call to your attention the very excellent mortality figures given here for advanced appendicitis. We feel certain that we shall soon be reading of the wonderful results obtained from the use of sulfapyridine in similar cases. It is doubtful that the sulfapyridine advocates can equal these mortality figures.

Warren Poole.

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**"True Cyst of the Pancreas. Total Extirpation (Kyste Vrai Du Pancreas. Extirpation Totale." By Charles LeFrancois, F.A.C.S., Chirurgien de l'Hotel-Dieu, Montreal, L'Union Medicale du Canada, Volume 69, Number 4, Page 368.**

Credit is given to Judd, of the Mayo Clinic, and his collaborators for the first definite and extensive report about cysts of the pancreas, the report appearing in two articles in the Archives of Surgery in 1931. In those two articles 47 cases were reported. This important report by Judd and his associates has served as the basis for all articles by English and French authors upon the subject since that day.

Cysts of the pancreas are divided into true cysts and false cysts, the latter being more frequent.

False cysts may appear after a traumatism of the pancreas or after a pancreatitis.

The author classifies true cysts of the pancreas in four groups: (1) Cysts due to parasites, usually found only in localities where the echinococcus is present. (2) Cysts due to faulty development, including congenital lymphangiomas of the pancreatic region, and cysts associated with polycystic disease, in which case there may be cysts of the kidneys, of the liver, of the spleen, and, rarely, dermoid cysts of the ovary.

(3) Retention cysts designated by Brocq as cananiculer cysts.

(4) Neoplastic cysts or cyst-adenomas. These cysts are ordinarily benign, but may undergo malignant changes.

In connection with the symptomatology, the author directs attention to the practical absence of all symptoms, with the exception of those due to the volume of the cyst.

The location of the cyst may be in the head, the body, or the tail of the pancreas. In growing, they develop most often between the stomach and the colon, but may develop between the stomach and the liver, and, more rarely, in the lower part of the abdomen.

In the differential diagnosis one must consider hydronephrosis cysts of the spleen which are exceedingly rare, and more particularly cysts of the messentery. Radiography quickly eliminates hydronephrosis and cysts of the spleen. Cysts of the pancreas are less mobile than those of the messentery. However, the differential diagnosis between a cyst of the tail of the pancreas and some other type of cyst may be difficult.

The best treatment for a true cyst of the pancreas is a complete extirpation, removing at the same time a small amount of pancreatic tissue. This, unfortunately, cannot be done in every case. Referring to the report of Judd and his associates, the author says that out of the 47 cases reported a total extirpation was done in all but 7 patients, and in these 7 the cyst was located in the tail of the pancreas.

If a total removal cannot be done, the surgeon has to content himself with doing a marsupialisation.

In connection with this article, there is one case report. The patient was a woman 42 years of age. She came to the hospital March 20, 1939, because of the presence of an abdominal tumor which had been noticed since a confinement on August 30, 1938. At first the mass was about the size of the ordinary fist, but it gradually increased in size. It was movable. It was not painful. The mass increased in size progressively, and when she came to the hospital it was the size of the head of an ordinary infant. The location of the mass was, and had always been, in the upper abdomen to the left of the umbilicus.

The abdominal wall was elevated in the left superior quadrant, and a mass about the size of an ordinary infant's head could be felt in that locality. It appeared to be smooth. It was not firm, but renitent. The mass was movable from side to side, but much less movable in a vertical direction.

The general condition of the patient was good.

An X-ray examination of the colon after a barium enema was practically negative. A pyelography was done, and it was negative.

After the investigations, the diagnosis rested between a cyst of the mesocolon and a cyst of the tail of the pancreas. Taking all things into consideration the probable diagnosis was cyst of the tail of the pancreas.

Operation was done on March 29, 1939, through a mediorectus incision 7 inches long, the incision extending both above and below the level of the umbilicus.

After opening the gastro-golic ligament the cyst appeared. The hand was swept around it, and it was demonstrated that it was independent of the mescolon.

The cyst being rather tense, it was decided to remove a part of the contents, and this was done by introducing a fine needle attached to a syringe without piston, the surrounding areas being first protected by compresses. The liquid removed was clear and slightly viscid. In all, the amount was around 1200 c. c.

In the meantime, it had appeared more and more clear that the cyst was attached to the tail of the pancreas. The area of attachment was limited in extent, it being about 3 cms. x 1 cm. The wall of the cyst at its base was very vascular.

"Because of the site of the cyst in connection with the tail of the pancreas, because of the small surface attached to the pancreas, because of the absence of adhesions to the posterior peritoneum and the mesocolon, and because of the absence of any evidence of an acute syndrome, we eliminated false cyst of the pancreas which would be better treated by a marsupialisation, and came to the conclusion that we were dealing with a true cyst of the pancreas, the proper treatment of which is, if possible, radical extirpation.

"The cyst was separated from the surrounding structures, and was removed, a small portion of the tail of the pancreas being removed with it. At the point of attachment to the pancreas there was a firm tumor about the size of a small prune. This was thought to be a small adenoma.

Briefly, the report of the histologist was, 'Cystic adenoma of the pancreas; no evidence of malignancy'.

The post-operative course was entirely satisfactory.

LeRoy Long, Sr.

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## *EYE, EAR, NOSE AND THROAT*

**Edited by Marvin D. Henley, M. D.**
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**"Treatment of Vernal Catarrh With Solid Carbon Dioxide." Vita La Rocca, M.D., New York. Archives of Ophthalmology, May, 1940.**

The using of carbon dioxide is not new but the author has devised a small container of wood and metal that makes the manipulation much easier. The carbon dioxide now is much easier of access since it can be purchased in the form of dry ice at many places instead of preparing the solid product from a tank of gas. Ten patients were treated by his method. Some were followed for more than four years, showing uniformly good results.

The method of application is: Four per cent cocaine hydrochloride for ten minutes; eversion of lid, showing plainly the cobblestone vegetations; the cornea is protected by the everted lid. The point of the carbon dioxide stick is brought in contact with the vegetation for about forty seconds with a moderate amount of pressure. This leaves a circular area, white and frozen. The stick of carbon dioxide is swabbed at the point with alcohol and the procedure repeated. The entire surface is covered at one treatment. The conjunctiva is allowed to defreeze before the lid is turned back to normal. This is repeated weekly. The usual reaction is congestion and slight pain. Usually the symptoms are lessened after the first few treatments. All other form of treatment is discontinued. Some of the cases reported were treated as long as three years—some were completed in five months.

The ten cases are reported in detail. The beneficial effect is the freezing, not the chemical properties of the carbon dioxide. The failure of a variety of treatments is probably due to the fact that the pathologic process is not only in the conjunctiva but also in the superficial layers of the tarsus.

There is quite a discussion of vernal catarrh in relation to allergy. The author thinks that the high percentage (50 per cent) of cases reported as instances of vernal catarrh associated with allergy would probably be reduced if a proper diagnosis were made in the first place. He says that cobblestone vegetations must be present to have a diagnosis of vernal catarrh.

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**"Treatment of Trachoma With Sulfanilamide." Wesley G. Forster, M.D., Fort Apache, Arizona. American Journal of Ophthalmology, May, 1940.**

The author gives a detailed account of the routine treatment in trachoma cases for the previous five years to the sulfanilamide therapy. This required an average of two and one-half years to arrest the trachoma. The sulfanilamide was given in amounts of one-half grain per pound body weight in four divided doses daily. The course of treatment was ordinarily twenty-one days. If deemed necessary, the course was repeated. When the sulfanilamide therapy was instigated, all other forms of treatment was stopped. I will quote the author's results of sulfanilamide therapy:

"Of the 167 children treated with sulfanilamide, the pathology in 125 became arrested within 30 days of the beginning of treatment. The remaining 42, in whom conjunctival and corneal activity was still present, were given a second course and, as a result, the disease became inactive. Definite improvement was seen consistently within 10 days of beginning therapy and was characterized by the fading, first of the papillary hypertrophy and second of the follicular hypertrophy. Corneal activity, when grossly evident, responded rapidly, but the punctate fluorescein-staining epithelial lesions disappeared slowly, sometimes not until a month or two after the activity in the lids appeared to be clinically arrested.

The effect of sulfanilamide therapy on early trachoma was very striking. Frequently both conjunctiva and cornea returned to normal within the first ten days. In advanced cases with extensive papillary hypertrophy, deep-lying follicles, and much corneal involvement, the effect was slower. Frequently a clearing of both conjunctiva and cornea continued for weeks after the drug had been discontinued.

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**"Sulfanilamide in Treatment of Acute Infection of the Ear and the Mastoid in Infants and in Children." Howard M. Hebble, M.D., Philadelphia. Archives of Otolaryngology, May, 1940.**

This is a critical review of seventeen cases with purulent aural infection that were treated with sulfanilimide. They occurred from January 1938 to March 1939 at the Children's Hospital; the ages ranged from six months to nine years. These cases all cultured hemolytic streptococcus and gave indication of mastoid involvement. The duration of the discharge varied from six days to six weeks; temperature ranged from 99 to 102 degrees F; tenderness over the mastoid region was occasionally present; roentgenograms seldom confirmed the otologic impression of mastoiditis with bone necrosis based on the appearance which was invariably present at operation. Charts and case reports accompany the report. The author's own conclusions are:

This study of the treatment of purulent aural infections so characteristic of mastoid involvement in infants and children has led to the following opinions:

1. These patients showed a generally poor response to conservative medical treatment, including the use of sulfanilamide.

2. If the administration of the drug is not to be discontinued until there is a complete clinical cure, as recently advocated by Long and Bliss, it will require longer than ten days to two weeks in many patients with this type of infection.

3. In view of the clinical observations and the relatively nontoxic effects of the drug as used in these cases, a larger dose and a longer period of use now seem not only safe to try but necessary for better results.

4. In cases of this sort in the wards of the otolaryngologic department of the Children's Hospital, if the patient's ear has been discharging less than four weeks, continuous sulfanilamide therapy throughout several weeks seems feasible providing there are no definite toxic effects.

5. However if the duration of otorrhea has already exceeded four weeks when the patient is first seen, operation still seems advisable if the otorrhea and leukocytosis have shown no definite response after ten days to two weeks of sulfanilamide treatment. After operation the drug may be administered to better advantage.

6. In the presence of intracranial complications sulfanilamide does mask certain typical symptoms. This is to be kept in mind, but not to be offered as a contraindication to the use of the drug.

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**"Nasal Osteomata." A. S. Handousa. Cairo, Egypt. The Journal of Laryngology and Otology, April, 1940.**

During the past seven years, out of 840,000 patients treated at the Nose, Throat and Ear Department, Kasr-El-Ainy Hospital, Cairo, there were only 37 cases of benign new growths found; Osteomata—18; Fibromata—14; Angiomata—2; Papillomata—2; Reticuloma—1. There was no tuberculous or syphilitic element found and the Wassermann reaction was always negative. There was no similar new growth in other parts of the body or in other members of the same family. The fundi were quite normal. There were no central nervous symptoms. The eighteen cases are reported in detail with many excellent illustrations. It was noted that: Males are more commonly affected than females; age incidence was between 12 and 54, the majority being below 28; except in one case osteomata have been single, and they were all unilateral; the first 13 cases were definitely attached to the frontal bone; other places of attachment were the tumour of the spine, free in the ethmoid labyrinth, external angular process and the os planum of the ethmoid bone. There is a large divergence of opinion as to the causation. The literature mentions such as tuberculosis, syphilis, sinus inflammations, ossified polyps, sequestrated rests, etc. Symptoms were many times not particularly pronounced, many of the osteomata being discovered during a routine examination. However, some symptoms such as simple swelling were present and an exophthalmos produced by pressure. The principles of the author's treatment is as follows:

1. To ascertain beforehand the exact site of attachment of the osteoma to the affected bone by X-ray investigation. This simplifies the operation and saves time and mutilation, as cutting through the affected bone slightly beyond the site of attachment leaves the tumour with its cartilaginous covering and pedicle

quite free in its cavity, ready for removal. In that way, too, recurrence is avoided.

2. The cavity left, usually a dilated sinus or group of sinuses is carefully examined as regards the presence of pus and the condition of the mucosa and dealt with accordingly, always providing a suitable intra-nasal drainage and closing the wound externally.

Unusual bleeding does not take place and so previous carotid ligature recommended by some surgeons has not been necessary.

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## *PLASTIC SURGERY*

Edited by George H. Kimball, M. D., F. A. C. S.
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**"Preserved and Fresh Homotransplants of Cartilage." By James Barrett Brown, M.D., F.A.C.S., St. Louis, Mo. Surgery, Gynecology and Obstetrics, June, 1940; Page 1079.**

Since the reports of the use of boiled bone flaps in neurosurgery in 1928, it has been thought that cartilage might be preserved or refrigerated so that it might be used for a subcutaneous prosthesis. A summary of clinical observations made over the last eleven years is given by Dr. Brown.

SOURCE OF PRESERVED TRANSPLANTATIONS

A constant supply of foreign cartilage is difficult to maintain. It has been obtained from excess cartilage obtained in autogenous transplantations from other patients, and open operations on the thorax. However, the most constant source of supply is obtained from autopsy material. The subjects, of course, must be of known race and age, and should be free from contagious disease. The cartilage is preferably taken from young adults and must be free from calcification.

STORAGE

Alcohol was originally employed for simplicity and safety. The cartilage being thoroughly washed in saline before implantation. Other preservatives and freezing may be used. Freezing may perhaps be the best means in a known refrigeration system with sterile cartilage, but these conditions are difficult to obtain.

ZOO GRAFTS

Animal grafts were tried in the early work on this subject, but have been discarded as unsatisfactory.

FOREIGN MATERIALS

Ivory has apparently been satisfactory in some instances, but has been known to be extruded years after implantation. In animals, wood, rubber and celluloid have been maintained for several years, but have not proven clinically satisfactory. Some of the newer plastics and metals are now under observation, but several years will be required for a final decision.

Dr. Brown believes that the best possible prosthesis would be one that can be injected, carefully molded, and would then retain its shape. Liquid suspension of cartilage has been considered especially for small defects. Parafine is still thought to be too unsafe for use.

The fate of preserved cartilage transplantations has been discussed in previous articles. Briefly it may be stated that in a good many instances the preserved transplant is absorbed and replaced by fibrous tissue. In other instances the cartilage may be completely absorbed.

CLINICAL EVALUATION

The benefits of preserved over fresh autogenous cartilage may be as follows: (1) no operation on chest of patient; (2) a large amount is available; (3) patterns can be made more easily; (4) probably not as apt to curve and distort tissue; (5) may be used as a temporary prosthesis either intentionally or as a necessity. The objectionable features are: (1) it is not very esthetic, especially if race or color is off, or if there has been some disease in the donor patient; (2) it is not as resistant to infection; (3) it may be completely absorbed without infection; (4) it needs an especially good bed without tension on the wound; (5) if it becomes too hard, irregularities cannot easily be trimmed subcutaneously; (6) if one fails it is probably best to repeat with fresh cartilage.

Single L-shaped nasal transplantations are used routinely by cutting the pattern out of the angle of the cartilage. This avoids bending a single piece or running the risk of the use of a single piece of cartilage without columella support. It is put in through an incision down the columella.

Fresh cartilage transplants from other individuals may be used. This is especially desirable in children where a sufficient costal cartilage has not been developed. The donor in this instance is preferably a parent or near relative, but this is apparently not necessary.

Any type of cartilage is apt to curl and cause deformity. Dr. Brown at the present time is making observations in the use of vitalium core in his cartilage. This paper presents some new ideas as well as restating some ideas which are already established.

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**"Severe Injuries of the Face: Some Considerations in Their Diagnosis and Treatment." By Allyn King Foster, Jr., M.D., Jr. Assistant Surgeon, New York Post-Graduate Hospital, N. Y. American Journal of Surgery, Page 391.**

Dr. Foster states that the purpose of his article is to present some principles in diagnosis and discussion of some indications for treatment which should routinely be followed in injuries of the face. He further states that several experiences with maltreatment has led him to consider this subject. He states further that in many instances it is necessary that several specialists, namely: the neurosurgeon, the eye, ear, nose and throat, general and the plastic surgeon, join forces in the reconstruction of severe traumatic injuries.

EYE INJURIES

Superficial eye injuries might lead to a great source of error. It is of utmost importance to diagnose the condition of the eye; to determine the status of the sight, and status of the extra orbital muscles . An opthalmoscopic examination is indispensable, as is some idea of the amount of vision present. Traumatic corneal ulcers are more frequent than is generally suspected. The treatment of corneal ulcers, when diagnosis is prompt and when the anterior chamber of the eye has not been entered, is simple. Pupils should be kept dilated by atropine and the eye covered. Lacerations in the eye, especially the upper lid, may be very serious because of the likelihood of infection and penetration of foreign bodies. X-rays are essential in all penetrating wounds where foreign body retention has been at all possible.

NOSE INJURIES

A complete examination of the nose may usually be carried out without x-ray. Careful examination should be made of the status of the air-ways as well as the frame work of the nose. Subcutaneous emphysema will lead one to suspect a rupture of the para-nasal sinus. Examination of the lacrimal duct should always be carried out. A simple test to determine its patency is to put a small drop of mercurochrome on the lower eye lid and look for its appearance beneath the inferior turbinate. This test should not be tried in the presence of hemorrhage.

WOUND SUTURES

Dr. Foster believes that all wounds showing excessive bleeding should be sutured; however, the indications for suturing multiple small laceration-contusions and perforations from splintered glass are less certain. One must first make certain that the functions of the face are not interfered with, and if interference is present, repair is most certainly indicated.

Dr. Foster lists the most important functions of the face as:

1. Sight.
2. Movements of all muscles of facial expressions.
3. Movement of eyes.

4. Chewing.
5. Lacrimation.
6. Salivation.
7. Hearing (that part which deals with the external ear).
8. Normal passage of air through the nose and the mouth.
9. A pleasing cosmetic appearance.

Dr. Foster believes that the patient with extensive facial wounds should be put under observation in a hospital with an exact recording of the wounds as to depth and extent. Too often a patient is neglected because no one troubles to examine the wounds of the face as to their extent.

The principles of repair of facial wounds are:

1. Hemostasis.
2. Conservation of tissue.
3. Minute approximation.
4. Minute attention to detail.

In conclusion, Dr. Foster says that there are no set rules with which a surgeon can be considered well trained for facial injuries, unless he has more than the general training given to develop "general surgeons" in the average institution. Too little is taught of the functions of the face and the importance of detailed diagnosis and repair of the facial injuries. "I believe the reason for this is the existence of overlapping specialties of neurosurgery, eye, ear, nose and throat, and general and plastic surgery." Some of the conditions mentioned in this paper sould lead to a better recognition and greater responsibility assumed by the doctors who accept the care of facial injuries .

Comment: This is an excellent paper calling to attention a timely subject and should bring all of us to a further recognition of our responsibility in the care of extensive facial injuries. We should all feel a great responsibility in any extensive injury and make every effort possible to reconstruct these injuries as nearly perfect as possible..

## *ORTHOPAEDIC SURGERY*

Edited by Earl D. McBride, M. D., F. A. C. S.
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**"The Local Implantation of Sulfanilamide in Compound Fractures: Its Effects on Healing." J. Albert Key and Thomas H. Burford, Southern Med. Jr. Vol 33, No. 5, May, 1940.**

The authors were greatly impressed by the excellent results which have been reported in the use of sulfanilamide locally in compound fractures. The work primarily was reported by Jensen, Johnsrud and Nelson in July, 1939 and the authors have been using this with very satisfactory results. They have been curious as to the effects on healing with the local implantation of sulfanilamide. The results quoted by Jensen, Johnsrud and Nelson of 38 compound fractures and 2 compound dislocations in which 5 to 15 grams of sulfanilamide crystals were implanted in the wound and primary closure was done, showed not one single incidence of primary wound infection. Later the wounds were recompounded in two instances and became infected. A previous series of 94 compound fractures treated by the same methods, except that sulfanilamide was not used in the wounds, showed the incidence of infection in 27 per cent and there were 7 cases of gas gangrene and 5 amputations.

They found also that the local implanation, while it did not kill staphylococci, inhibited their growth and permitted the body to control the possible infection.

The authors in the control period of experiments on rabbits implanted sulfanilamide in some in the forelegs on one side and did not on the other, to check the healing period both clinically and by sacrificing the animal. This was done also on some dogs.

The conclusion of these experiments was that the local implantation of sulfanilamide crystals in compound fractures tends to lessen the danger of infection and does not perceptibly interfere with union of the soft tissues or of bone.

The authors wish to point out that local implantation of sulfanilamide does not permit closing of grossly contaminated or infected wounds. These must be debrided in the usual way and cleansed, devitalized tissue removed and closure effected if possible, in wounds that are not already grossly infected.

In large open wounds with extensive loss of skin and soft tissue, sulfanilamide crystals are sprinkled over the area, after sterile cleansing, and vaselized gauze implanted.

The question of the use of sulfanilamide in clean surgical wounds as a preventive of infection is brought up, but is not recommended in that post-operative infection is so rare it would not warrant the use.

(Note by the abstractors): This particular treatment has been used by us for the past several months, with excellent results. We find clinically that it inhibits infection in compound fractures and permits early closure. To date we have been fortunate enough not to have had a case of gas gangrene develop following its use.

**"The Surgical Treatment of Recurrent Dislocation of the Shoulder Joint." Svante Orell, Stockholm, Sweden. Surg. Gyn. & Obst. Vol. 70, No. 5, May, 1940.**

It is pointed out by the author that in treating recurrent dislocation of the shoulder joint by surgery there are three possible approaches; (1) surgery involving the joint capsule and joint ligaments; (2) the tendons and muscles; or (3) the bones of the joint. In addition, these methods may be combined in many ways.

The author prefers the use of bone block or reconstruction about the joint rather than of the muscles and tendons. He describes in detail several of the original operations which have been devised for creating a bone block in the anterior and inferior portion of the glenoid to prevent the dislocation.

Eden, in Jena in 1917, was the first to use this method. His method and several that followed, required the opening of the capsule and considerable surgery about the joint. Also, required prolonged immobilization post operatively and thus in the author's opinion reduced part of the value of surgery by creating rather stiff joint for several months.

In 1927, Speed improved this method somewhat by boring a hole one inch deep extracapsularly into the inferior border of the scapular neck and inserting a tibial transplant into the canal so that it projected three-quarters of an inch in front of the articular border.

The author describes a procedure in which os purum is used in a manner similar to that of the Speed technique. The os purum is a prepared bone which is autoclaved and from which all organic material has been removed. He uses the compact type of bone and uses first a prepared instrument exactly the shape of the os purum, shoves it into the neck of the scapula, withdraws it and inserts the os purum and taps it into place. This is cut off short so that it just projects beyond the glenoid lip and holds the head of the humerus in position. The arm is held in adduction for approximately two weeks, after which exercises are gradually begun. His technique, which is as he admits essentially that of Speed's, is rapid, does not require removal of bone from other portions of the body due to the use of os purum and permits rapid use of the arm. A case is cited of excellent, early function.

The abstractors feel that at present the use of the Nicola operation, which is a tenodesis of the biceps tendon, is their operation of choice. The use of os purum has not been general in this country and consequently the Speed operation is the one preferred if a bone block were to be used.

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Submitted by Earl D. McBride, M. D.

## INTERNAL MEDICINE

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**"The Popularity of the Ewald-Boas Test Meal; Reasons For Its Survival." By Dino Sandroni, M.D., and Zachary Sagal, M.D., F.A.C.P., New York City. Annals of Internal Medicine, May 1940, Volume 13, No. 11, Page 2134.**

In this, the author gives us the answer to the question, which presents itself to both the clinician and the clinical pathologist, in a very brief and comprehensive manner.

His own summary and conclusion make a very satisfactory summary of the report:

Gastric analysis is a worth-while procedure in all cases presenting any aberration of the digestive functions.

The single aspiration method and the carbohydrate test meal are satisfactory and give sufficient information in 90 per cent of cases.

The remaining 10 per cent may be further studied by the fractional method, using histamine, neutral red or any other method for the differentiation between true and false achorhydria.

We believe that the procedure advocated by Wilhelm is not applicable for routine gastrointestinal examinations in the clinic or in private practice. The greater accuracy and scientific value of the method proposed is, in the predominating majority of cases, far outweighed by discomfort to the patient and by the additional laboratory work, without adding anything of clinical value. Because of the considerable labor involved in this procedure, the tendency on the part of the clinician, if the precise method were advocated as a recognized routine for general adoption, would be to omit the test altogether. Thus, a valuable aid in the management of gastrointestinal disorders might be neglected and fall into disuse.

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**"Progress in Chemotherapy of Bacterial and Other Diseases With Special Reference to the Prontosils, Sulfanilamide and Sulfapyridine." By John A. Kolmer, M.D., Professor of Medicine, Temple University School of Medicine, and Director of the Research Institute of Cutaneous Medicine. Philadelphia. Archives of Internal Medicine, April 1940, Volume 65, Page 671.**

In this, the author has described, in a very interesting and detailed manner, the progress of chemotherapy in connection with the use of the prontosils, sulfanilamide and sulfapyridine. The historic development of this most important advance in medicine is nationally reviewed. Therapeutic effects in the treatment of streptococcic, meningococcic, pneumococcic, staphylococcic, urinary tract (including gonococcic), undulant fever, chancriod, thyroid fever, Clostridium Welchii, tuberculosis, and miscellaneous bacterial and virus infectio and even diseases due to animal parasites are summarized. Many tables are given. The data is gathered from the reports of numerous authors and reports from widely distributed sections of the world, also from physicians representing a very great variety of specialties. The bibliography is, therefore, very complete and appears to be one which should be exceedingly helpful to any investigator who is interested in reviewing this subject.

Symptoms and signs of toxicity from the drugs are also reviewed.

As a result of the review, certain principles and dosages in connection with the administration are outlined, which may be given briefly as follows:

1. Early treatment.
2. A large initial dose.
3. Oral administration when possible.
4. Parenteral administration may occasionally be preferred as initial dose.
5. Four to six hours day and night administration.
6. Concentration of the drug in the blood varies in individuals and, therefore, blood determinations are helpful when large doses are necessary.
7. For severe infections, maintain a level of 10 to 15 mg.
8. For moderate severe infections, a level of 5 to 10 mg.
9. For mild infections determinations of concentration in the blood are not required.
10. Parenteral administration of sulfanilamide and neoprontosil in severe cases who can not take the drug orally.
11. It is frequently advisable to give the drug orally and parenterally, especially in the treatment of severe infections.
12. Intraspinal injections of 0.8 to 1 percent solutions of sulfanilamide are sometimes advisable.
13. Daily doses are reduced with improvement.
14. It is highly probable organisms may require a tolerance for any of the sulfonamide compounds.
15. These compounds apparently render bacteria not susceptible to immune bodies.
16. The incompatibilities are not well understood.
17. Restrict fluids in urinary infections.
18. Suggested doses of sulfapyridine in the treatment of pneumonia are given.
19. The doses of sulfanilamide in the treatment of gonorrhea are given.
20. Watch carefully for evidences of toxicity.

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## UROLOGY

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**"The Effect of Castration on Benign Hypertrophy of the Prostrate In Man." Charles Huggins and Roland A. Stevens, From the Dept. of Surgery, University of Chicago. Journal of Urology, May 1940.**

Whether benign hypertrophy of the prostate is under endocrine control is a problem of immediate interest since all workers are not agreed on this point.

The authors, in an attempt to throw light on this problem, selected three patients who were suffering from prostatic hypertrophy. A suprapubic cystotomy was performed and biopsy sections of the enlarged prostate was taken for microscopic examination and at the same time a bilateral orchidectomy was done. Twenty-nine, 86 and 91 days later, respectively, these patients were subjected to a second stage enucleation of their prostate and the tissue obtained at this operation was also examined by microscopic section.

A comparison of the microscopic picture of the two specimens of prostatic tissue before and after castration revealed significant histologic changes. Generally there was a diminution in the height of the epithelial cells lining the acini, as also there was a lessening in the diameter of the individual acini and a reduction in number of glandular elements.

Following castration on benign hypertrophy in man supports the view that the prostatic epithelium, at least, is under control of the testes.

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**"A Plea For the Abolition of the Retention Catheter In the Preparation of Patients For Prostatic Surgery." Richard P. Middleton, M.D. Salt Lake City. American Medical Journal June, 1940.**

This is a rather lengthy communication published in the "Clinical" notes department of the Journal. As the heading explains, the author believes that the retention catheter is in most instances a useless and dangerous mode of treatment for the pre-operative care of the average patient suffering from prostatism. He believes that if retention of urine is complete, frequent intermittent catherization is preferable to the inlying

catheter. He presents several valid arguments from his own experience to support this contention.

Comment: It is true that less emphasis is being placed on prolonged catheter preparation before submitting patients to transurethral surgery, but to advocate that the inlying catheter be discarded completely can hardly be supported by the majority with clinical experience. There is still a large group of patients who require continous bladder drainage before surgery is attempted. One cannot substitute in majority of these the intermittent method of catherization for various reasons; infection, bleeding, pain on passage of the catheter, etc. I am sure most urologists are thoroughly convinced that the properly placed inlying catheter is a much better tolerated method of promoting bladder drainage over a period of days than the practice of frequent catherization.

Excellent as this article is on a controversial subject, in my opinion the editorial staff of the Journal showed poor discriminatory judgment in allowing its publication. After all, it is only one individual's opinion as to the merits or demerits of a fairly acceptable and traditional mode of treatment which has been proven by the experience of years.

The Journal is a publication widely read and its prestige is high. What is printed in its pages is by many accepted as scientific verity. For that reason all articles that appear on its pages should be selected with the viewpoint of the general profession kept in mind. Certainly the complete abolition of the inlying catheter in the treatment of prostatism is not a generally accepted dictum in the practice of most urologists of the present day.

### Fellowships in Chemistry Are Established

For the academic year 1940-41, Abbott Laboratories has established fellowships in several universities with important departments of organic chemistry and biochemistry. The fellowships, carrying stipends of $650 per year, will be available to graduate students in the last or next to last years of graduate work leading to the doctorate degree. The recipients, who are to be selected by the universities in which their work is being done, are not limited as to the subjects on which they will work.

The object of the fellowships is to provide means for the carrying on of additional scientific work in American universities. The future progress of chemical developments in this country will depend upon the availability of well-trained and qualified men, and it is the intent of Abbott Laboratories in establishing these fellowships to lend encouragement in these general fields.

Grants will be made to the following universities: In organic chemistry—Cornell, Harvard, Illinois and Michigan; in biochemistry—California, Columbia and Cornell.

### Dangers in Sugar Solutions Shown

Concentrated solutions of sucrose (sugar), often injected into the vein to reduce increased blood pressure within the skull, should not be administered to patients with kidney damage, and large or repeated doses by vein should be avoided in any case, W. A. D. Anderson, M.D., and W. R. Bethea Jr., Memphis, Tenn., warn in The Journal of the American Medical Association.

They report the finding of kidney lesions during postmortem examination of six patients given such solutions. Although the degree of functional damage from such lesions has not yet been determined, it seems probable that there is significant change in the kidneys' efficiency, the authors believe.


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